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Improved Single-Needle Knitting Machine.

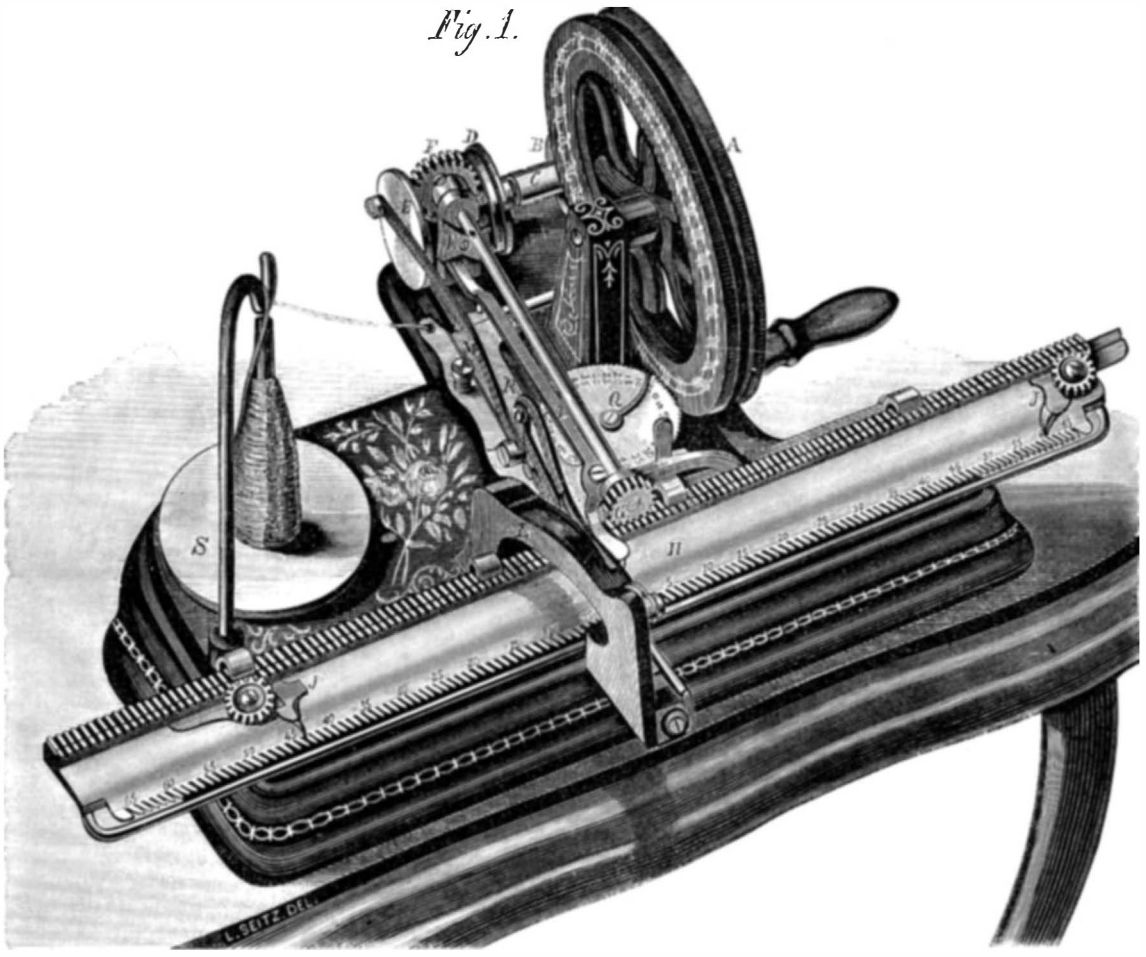
The Hinkley Family Knitting Machine is the result of a successful attempt to produce a Knitting Machine adapted to the formation of all plain or fancy knit fabrics for family use in a simple and expeditious manner, while free from the complications to which all other "Knitters," with needles numbering from 75 to 125, are subject, although they are generally capable of producing merely a straight circular tube, only susceptible of change by varying the tension of the loop or stopping the machine and taking out or inserting needles each time it is desired to widen or narrow a single stitch.

The desideratum of a simple, cheap, and yet substantial household machine, producing the handsomest and best work, is obtained by the use of a single eye-pointed needle, in connection with a simple looping mechanism and a work-supporting comb traversing longitudinally in front of the needle, which by suitable contrivances, is governed in its motion either automatically or by the operator at option, according to the design of the intended fabric.

The driving wheel, A, Fig. 1, is supported by a standard on the base of the machine, adapted by its crank for hand power, and by passing a band over its grooved periphery to a balance wheel under the table, for a treadle, as in sewing machines. It drives the friction pulley, B, on the shaft, C, which engages in the groove of the driver.

This pulley is the subject of a special patent, and is composed of two parts or halves—one fast and the other loose—facing each other and holding between them a thin circular disk of steel, which by two equi-distant corrugations, springs them apart and is adjustable by set screws, thus giving a short connection without the usual wear on the journal, making no noise, and having a slip sufficient to save the working parts should any obstruction suddenly interfere when in rapid motion.

Fig. 1.



THE HINKLEY PATENT KNITTING MACHINE.

The disks, D and E, on shaft, C, engage through a right and left hand worm respectively on their inside faces, with the gear, F, and through its shaft and corresponding gear, G, communicate a traversing motion to the rack on the comb, H, of one tooth to each revolution of themselves, each of course reversing the former direction, as by the lever, I, the gear, F, is thrown from connection with one to the other worm.

This shifting lever, I, is either worked automatically at its anterior projection by the arrival of the indexes, J, on the comb—which are moved to any point on the comb at pleasure, governing the width of the fabric—or by shifting the lever by the finger of the operator, in each case, if desired, while the machine is at high speed. The change of position of the lever, I, cants the dog, K, centered in a slot on a swinging bearing, which dog, then striking a small projection on the inner face of D or E, between the worm and the journal, throws the gear, F, into connection with the opposite worm at once, reversing the direction of the rack.

The necessary reciprocating movement of the needle carrier, which holds the needle and its tension, is obtained from the crank pin on the disk, E, by a connecting bar, M, which also operates the looping mechanism, supported on the bracket, L, through the medium of the slotted arm, N, and the oscillating quadrant, O, (see Figs. 2 and 3), in exact conjunction with the advance of the needle, P, and replaces a new loop on such successive tooth of the traversing comb as the needle removes its predecessor.

The numbers to which the indexes, J, Fig. 1, point show at once the width of the fabric, while they remain in that position, and the counter, Q, is pushed forward one notch by each change of the lever, R, giving, at a glance, the number of stitches in length that the work has progressed, thus automatically saving the old drudgery of counting each stitch, as is still necessary in hand work, or by other knitting machines, and reducing the labor of knitting a stocking or any other fabrication, to a simple rule of changing the indexes at such times as the counter has enumerated a certain number of loops or stitches in length.

The bobbin, S, is attached or detached from the base by means of a short screw, projecting from its bottom, which screw also fits in a screw shank in the center of disk, E, and by springing the connection off the crank pin and lifting the gear, G, from the rack by the cam lever, I, the bobbin can be attached to the disk, E, and the machine is instantly transformed into a self-spooler, which winds its yarn from the swifts at great speed without interfering with the work on the machine. Beside obviating the use of a spooling machine and bobbin stand, this arrangement provides against the interference of a child or others during the absence of the operator, as while disconnected, as it is in a second, work in progress cannot be disturbed.

Fig. 2

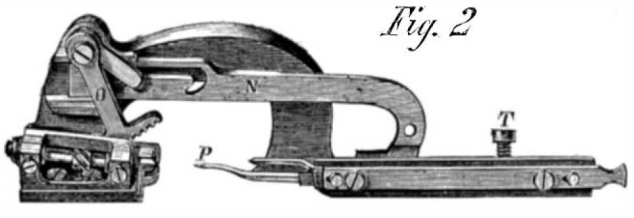
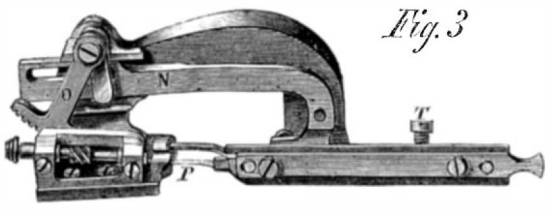


Fig. 3



The work hangs from the teeth of the comb in front of the machine, in the plain view of the operator, and, unlike all other knitting machines, this uses no weights to drag down the work from the needles, thus requiring a different weight for each variety of work; here a small rod, seen under the comb, obviates their necessity. In Figs. 2 and 3, T represents the tension screw, which will regulate the yarn to be knit, close or loose. In one the looper and needle are in contact, as when the stitch is to be removed, and the other shows them receded from one another.

It will also be apparent, that by the use of a traversing comb, of any length, either straight, curved, or circular, that one needle performs the work previously requiring as many needles as the comb has teeth, that the "widening" and "narrowing" is adjusted, stitch by stitch, or as many as is desirable, in an instant, by sliding the indexes along the comb. By the arrangement of the "looper," taking the loop from the under side of the needle at each advance, and placing it on the tooth in readiness, it "sets up" it own work and will not require the loops to be "cast on" previously by hand, that the stitch must be the same as that taken by hand from one needle to the other, and that each edge will be a selvedge edge like cloth, and the top of the work—as for instance, a stocking—will be "finished" as it comes from the machine.

From the simple arrangement of parts, it is also evident that both the work and the machinery are in full view of the operator, and easily understood by any one; the machine can be run by the hand or the foot, like a sewing machine; that any size yarn or cord can be used that will pass between the teeth of the comb, which are constructed to admit of all grades,; that by its gearing an extreme high speed can be reached, which, with the quickness of widening and narrowing, gives it the pref erence over the hitherto "fast" knitters; that any desired shape can be produced, regular or irregular; that the tension can be altered in a second; that by reason of its friction gear and worm arrangement it is almost noiseless. It also knits the buttonholes in a garment, knits in different yarns without tying them together; knits any fabric from an Afghan to a pair of gloves; knits a stocking complete with a hand heel, knits double if desirable, and requires only a seam up the back to produce hosiery equal to hand-knit, and superior to those formed of a tube with only a small "bulge" on them for heels, and which, after washing, are liable to return to an almost uniform tube.

This machine is patented in this country, Great Britain, France, Belgium, New Brunswick, etc, and received a medal for simplicity at the Paris Exposition. It is manufactured by the Hinkley Knittting Machine Co., at Bath, Me., and all orders and applications for agencies, etc., should be addressed to Edward Sewall, the Sup't and Treas., at that place. G. E. Harding, the General Agent for New York, will also furnish information and machines at his office, 726 Broadway, New York city.

Period of the Growth of Man.

Prof. B. A. Gould, from statistics derived from the register of two and a half millions of men in the U. S. Army, has brought out the fact that men attain their maximum stature much later than is generally supposed. This takes place commonly at 29 or 30 years of age; but there are frequent instances of growth until 35, not very noticeable,—a yearly gain of a tenth of an inch perhaps, still a growth. After 35 the stature subsides in similar proportions, partly perhaps from the condensation of the cartilages, partly because of the change in the angle of the hip bone. The age for maximum stature comes earliest to the tallest men, as if it were the necessity of unusual development. Foreigners were shorter than men of native birth. The hights of men seemed to depend on the place of enlistment. A Massachusetts man enlisting in Iowa was an inch taller than if he had staid at home. As we go West, men grow taller. One man measured more than 6 feet 10 inches. Out of one million, there were five hundred thousand who measured more than 6 feet 4 inches; but men of such stature do not wear well. In Maine, men reached their greatest hight at 27, in New Hampshire at 35, in Massachusetts at 29, in New Jersey at 31. The tallest men, of 69 inches, come from Iowa. Maine, Vermont, Ohio, Indiana, Minnesota, and Missouri, give us men a little over 68; and the average of all shows the Americans to be "a very tall people."

THE WEIGHT of a million of dollars in gold (currency) is 53,750 Troy ounces, or 4,479 lbs. 2 oz., equal to 2 ¼ tuns.

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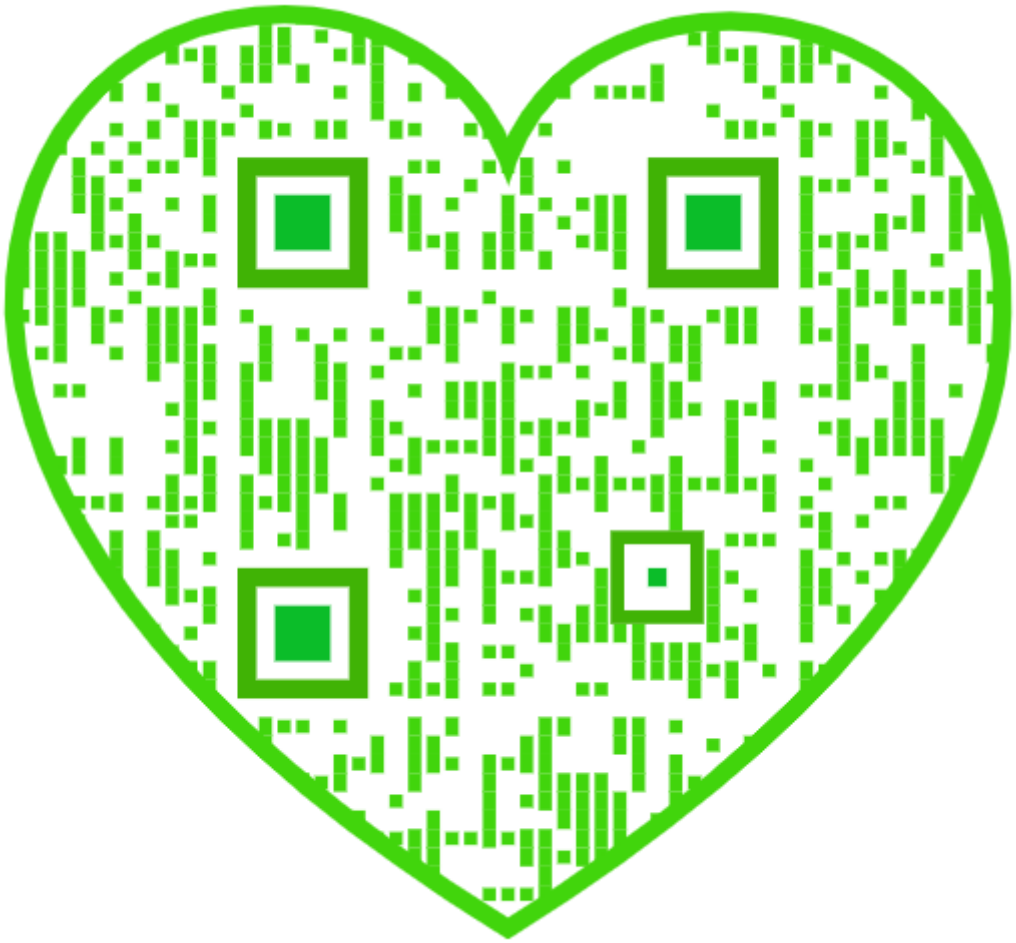

EDITORIAL CORRESPONDENCE.

From Germany to Italy over the St. Gothard—Swiss Towns, Mountains, Lakes, Glaciers, and Rivers

Arona, Lake Maggiore, Sept. 10, 1867.

I suppose that no other country in Europe is so well known to tourists as Switzerland. Easy of access from Great Britain and all parts of the Continent, it is not surprising that so many travelers rush to this most wonderful region. It is roughly estimated that fifty thousand English people visit Switzerland during the months of July, August, and September, and I should judge that about one half of the whole number of visitors this season were Americans, some of whom are wonderfully expert at climbing Alpine hights, and in itinerating on foot over long fatiguing passes. The only ascents of Mont Blanc which have been made this season were performed by two gentlemen from New York. With the exception of some of the smaller mountains, the ascents of which are comparatively easy, I have contented myself with a view of the immense snow-capped summits from beneath, rather than undergo the peril and fatigue of undertaking to climb to their tops. Switzerland is literally a land of mountains, lakes, cascades, glaciers, and rivers, the charms and grandeur of which have inspired the pens of poets, philosophers, and sages, who seem never to weary of their ceaseless beauty and variety. Gibbon found a spot upon the lovely shores of Lake Leman where he devoted himself in tranquility to the preparation of his great history of the Roman Empire. Byron watched the falling of avalanches of snow from the Jungfrau, and visited the gloomy prison of Chillon to fire his immortal genius, and Rousseau selected one of its choicest spots as the scene of his Heloise, which sentimentally has no equal in European literature. Nature seems to have thrown these vast mountain chains together to form an impassable barrier between the countries that lie on either side, but the skill and ingenuity of man has broken through them, and within the last few years the high road and the railway have been constructed to penetrate where it would seem almost impossible for man or beast to thread their way. Entering Switzerland from the rich and populous old city of Bale, which lies upon the Rhine, the railway for a considerable distance traverses a flat country, and then commences to ascend the mountains by a gradient of 1 in 20; the Mont Cenis pass is 1 in 12. Several valleys are crossed on bridges, and the line constantly rises, until in some cases the trains run high above the picturesque little villages down in the valleys below. The Unter Hauenstein, which is two thousand feet high, is pierced by a tunnel over eight thousand feet in length, and serves as an outlet for the chief traffic between western Germany and Italy over the great pass of the St. Gothard. From the hights at this point the first view is had of the immense snow peaks of the Bernese Alps, and the traveler is conscious of having entered a land which combines more of grandeur and sublimity than any other spot of equal size upon the globe.

The next most important city is Zurich, which, aside from its agreeable situation and extensive manufactures of silk and cotton, possesses very little interest, but historically it is remarkable as the place where Zwingli and Ulrich began the reformation in Switzerland. Zurich has been sadly afflicted this summer by a visitation of cholera, which in spite of every sanitary precaution has carried off many of its inhabitants and effectually stopped the flow of travel in that direction. And here I feel constrained to say that amidst all these wonderful charms of nature which abound in Switzerland, there are also added some repulsive features which cannot escape the notice of travelers. In spite of the abundance of water which invites every inhabitant to observe the strictest degree of cleanliness, I should say as a general thing that the rural populations were quite as filthy as those of any other country I have visited. The *châlets* are constructed to shelter under the same roof men, women, children, cows, goats, pigs, and poultry, and the practice is very common, even among farmers near the larger villages, to form the compost of stable manure and household refuse in the front door yard, the odors of which, it seems to me, ought to arrest the attention of the sanitary authorities. I do not wonder that the cholera has this year visited some of the Swiss towns—the wonder is that it has not prevailed to a more fearful extent. If extremes in nature abound in Switzerland, so also extremes meet in the social life, for among the more improved classes there is not only an aristocratic pride but a wonderful degree of good order and cleanliness; therefore as a general rule there is very much more to admire than to condemn.

Of the many points of attraction in Switzerland, no spot possesses more interesting features than Luzerne. The town itself is old and picturesque and by no means particularly nice, but the lake and surrounding mountain scenery, together with the historic associations connected with the name of William Tell, all combine to render this place one of the most sought after in all the Swiss Cantons. The land side of the town is still protected by an ancient wall surmounted by watch towers erected five hundred years ago, and there are some quaint old bridges across the Reuss, one of which has a curious fresco of the dance of death, which represents how the grim monster indiscriminately took his victims of every age, rank, and station, during the visitation of the plague in 1409.

A carriage drive of an hour and a half leads to the rude old chapel which was erected on the spot where Tell shot the tyrannical Gessler. The drive to this chapel along the borders of Lake Luzerne is grand and lovely in the extreme. The roadway is skirted by cheerful Swiss cottages, usually of the first class, beautiful fields well covered with fine fruit and park trees, and in sight of the Rigi and some of the peaks of the snowy Alps, which lift their white caps far above this most beautiful lake.

The most interesting object in Luzerne is the monument to the Swiss guards who fell while defending the royal family of France, Louis, XVI., Marie Antoinette and their children, when the infuriated mob attacked the Palace of the Tuileries during the first French revolution of 1792. The design is by Torwaldsen, and represents a lion of collossal size mortally wounded, with a broken spear in his side, endeavoring to hold in his paws the shield of the Bourbon family. The figure, 28 feet long and 18 feet high, is chiseled in the perpendicular face of a sandstone rock overhung by creeping vines and shrubs, and there is a small pond of water at the base of the rock supplied by a little streamlet that flows down the cliff, which forms a sort of mirror to reflect the image of the dying lion. The design of this monument is certainly unique, and when it is considered that these brave Swiss were hired soldiers and fell fighting for the royal family when assailed by their own subjects, it becomes most touching and impressive.

The ascent of the Rigi is made from the pleasant little village of Weggiss, which is reached from Luzerne by steamer in about half an hour. It is very fashionable to ascend the Rigi; therefore almost everybody undertakes it, and I must confess that the toil and fatigue are amply repaid by the wonderful panorama that breaks upon the vision. No carriage road has ever been constructed up this mountain, but the journey is performed either upon horseback or on foot; the feeble and infirm, together with fat English women and their poodle dogs, are carried up in chairs, for such people will very often persist in seeing everything. The summit is less than one mile above the lake, but the pathway zigzags along the western slope of the mountain a distance of nine miles, and traverses gardens, fruit orchards, and pasturage the whole distance. The view of the lake beneath and its emerald waters, which always remain visible, and the long chain of the Oberland Alps that lie beyond, impart to the journey a constant and thrilling interest. One of the singular features of the Rigi, peculiar also to many of these Alps, is, that it affords pasturage for flocks of sheep and herds of cattle to its very summit. Nothing is sweeter and more delicious than these mountain grasses, which constitute the principal wealth of the neighboring inhabitants. As the snows disappear the flocks and herds gradually ascend the mountain, following the productions of spring, which rise to life under their feet from day to day, until the snows of autumn compel them to retire to the valleys below. There are upward of four thousand cattle, chiefly cows, and numerous flocks of sheep that feed upon the Rigi, and the herdsmen reside in rough little *châlets* all along up the sides of the mountain. About one third of the distance up a small chapel has been erected for the use of the herdsmen. Apart from the spiritual benefits which this place affords to the humble worshippers, there is also attached to it a shed where excellent beer is supplied to refresh the weary body. This combination of chapel and beer-shed is not exactly according to the rigid institutes of Calvin—who I believe was a Swiss—but I notice that the pilgrims of Mont Rigi are usually very glad to partake of the refreshment thus offered. Vast masses of conglomerate rock lay scattered all along the wayside, and during some extraordinary upheaval immense boulders have been hurled down, to form archways over the path. Hotel accommodations upon the Rigi are abundant. The best, the Kaltbad, within a mile of the top, is much frequented for its magnificent views and bracing mountain air, and many visitors spend weeks at this comfortable resting place. A smaller hotel stands a little nearer the top, and the Rigi Kulm, a house capable of lodging two hundred people, is perched upon the very pinnacle, and is always crowded during the season, chiefly by those who wish to spend a single night.

I noticed upon the register of this hotel that names were registered as early as March 22d and as late as December 26th. In some places the narrow bridle path runs along the edge of fearful precipices, and a single misstep would throw the traveler hundreds of feet into the dark abyss beneath.

The day of our ascent was cloudless, and we reached the summit in good time to behold a most brilliant sunset, and at eight o'clock the full moon came beaming over the snowy peaks, which, reflecting upon the surrounding lakes, and combined with the myriad of lights thrown out from the numerous villages and *châlets* produced a most wonderful effect, much finer to my mind than that produced by either the rising or setting sun. At half-past three in the morning the sleepers were aroused by the Alpine horn, and in a few minutes the house was hurriedly emptied of its occupants, men, women, and children rushing out to gain the highest peak, some with bed blankets thrown over their shoulders, some in morning gowns and slippers, all anxious to witness the rising of the sun, which is considered one of the chief features of this mountain view; and indeed the sight is well worth all the trouble it cost to obtain it, but frequently, owing to the fogs that gather about the summit, thousands go away disappointed. I met one old gentleman who had doggedly persevered ten days in endeavoring to see the sun rise, and finally had his perseverance rewarded. The panorama of the Rigi sweeps over a circumference of three hundred miles, and embraces a combination which in extent and variety is scarcely equaled by any other in Switzerland. The labor of supplying the wants of so many visitors is prodigious. The supplies are carried up chiefly upon the backes of mules, but trunks, valises, and other articles are carried upon the backs of men and women. It is not unusual to see one of these men with his wooden rack strapped upon his back, lugging one of those immense trunks which are nearly as large as the *châlet* that covers his head, and scores of lads are eagerly watching to carry the pedestrians' effects up or down, and it is surprising how much they will undertake to perform. These people will sometimes make two of these trips in a day. The descent of the Rigi is most usually made on foot, as the exercise of riding down is not considered the most agreeable, and although not much of a pedestrian, by the assistance of an Alpenstock and an occasional draft of fresh milk, which is readily obtained at the wayside, I made the walk without much fatigue in three hours.

Lake Luzerne, or more properly the Lake of the Forest Cantons of Uri, Unterwalden, Schwytz, and Luzerne, which surround its shores, is unquestionably grander and more sublime than any other lake in Europe. It is completely walled in by stupendous mountains, with here and there a picturesque village, which seems to stand upon the accumulated debris which for ages has been washed down from the hights above. At one time, before roads were cut along the lake, one of these little villages boasted of being the smallest independent state in Europe, as its inhabitants, sheltered from assault, refused to recognize any other earthly government except their own.

At the upper end of the lake is the poor little village of Fluelen, where begins the carriage road over the St. Gothard into northern Italy. Diligences leave daily for Bellinzona, 76 miles, but travelers who wish to enjoy the scenery of this great pass to advantage, must either take a carriage or perform the journey on foot. Preferring the former as the more agreeable and less fatiguing, we engaged an outlandish-looking Italian *vetturini* to transport us over to Lake Lugano, which is twenty miles beyond Bellinzona.

The roadway follows the tortuous windings of the river Reuss the whole distance clear up to Lake Lucendo, near the summit of the pass. Its waters rush through the wild gorges of the mountains at a fearful velocity, the effect being always hightened by the immense rocks that stand in its pathway, and the volume is augmented by the numerous streams that flow down the mountain sides from the melting snows and glaciers.

Until 1832 this pass was only made over a bridle path. At that time, after twelve years of labor, the neighboring Cantons opened a carriage road—one of the finest in Europe. The engineering in some places is of the boldest character. Side terraces or galleries are cut along the face of the granite hights, sometimes at a distance of nearly a thousand feet above the river. In the narrower gorges it was necessary to let the workmen down from the top of the mountains by means of ropes, to enable them to drill and blast into the face of the rocks to get a foothold to work a tunnel underneath. And thus ascending, we reach at length

> "The Gothard's hights, where everlasting lakes,
> Fill'd from Heaven's founts, supply the streams below—
> Another river, issuing thence, will guide
> Thee into Italy, thy land of promise."

At the summit there are two common hotels, some peat beds, five St. Bernard dogs, and several little lakes of clear water, from one of which rises the river Ticino, which accompanies the tourist on his journey to Italy, down through the awful Val Tremolo, so deep that snow lays in midsummer upon its dark edges, and the roadway descends from this fearful hight by abrupt zigzags, which coil along the steeps like the folds of a huge serpent basking in sunlight.

I was thankful when we had rounded the last curve that brought us to the little village of Ariolo, where we rested for the second night. Here everything has an Italian appearance, and though it is many miles from Italy, the language and the customs are Italian. Owing to the existence of cholera in Italy, we were compelled to obtain a certificate from the Syndic at Faido that we had come from the mountains, but this did not save us from suspicion; therefore, upon arriving at Lugano, at ten o'clock at night, our carriage was stopped and we were invited to walk into a small room and undergo the agreeable process of fumigation; and upon leaving Lugano the next day for Lake Maggoire, and before crossing the frontier into Lombardy, we were again entertertained at "Hotel Fumiger." People coming up from Italy were required to quarantine for a few days before being allowed to proceed.

Many years ago I remember to have read a graphic description of the sensation of gloom experienced by the writer, of midnight in a ruined city and upon the lonely desert, but it seems to me that almost anything would be preferable to the awful dullness of this region. Hotels, streets, carriages, steamers all deserted, and a general melancholy hangs about everything. Such is the effect upon a people oppressed by the fear of cholera. The skies, however, are bright, and the vine, mulberry, and the fig grow luxuriantly. S. H. W.

Gatling's Gun in Europe.

A French journal announces that the Ordnance Department of France is quietly supplying Gatling's Gun to the artillery corps. The Press of Vienna says: The artillery committee, in presence of the Archdukes William and Regnier, as well as the Minister of War and a large number of officers, has just made some experiments with a new firearm, which has been called the *mitrailleuse*, invented by MM. Montigny and Christoph of Brussels. This weapon is composed of 31 steel barrels placed in a common tube. The apparatus opens behind and receives 31 cartridges which, by means of a piece of mechanism, enter the barrels. The 31 shots are fired successively, and the whole operation only takes 30 or 40 seconds. The experiments were not successful; many of the shots missed fire, and very few went straight, The *mitrailleuse* appears very inferior to the cannon on the Gatling system (American). The latter fires 100 to 120 shots a minute, and the former only 60 to 70. Messrs. Gatling, moreover, have much improved their cannon, and before long are going to submit to the Austrian Government a ten-barrelled revolver cannon which will fire 300 shots a minute.

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A NEW THEORY OF CHEMISTRY---THE GALVANIC BATTERY DISSECTED, AND SPECULATIONS CONCERNING OZONE.

At the meeting of the New York Lyceum of Natural History on Monday, 14th inst., a paper was read by Prof. Charles A. Seely, of this city, on "Chemical Dynamics." We present below the principal features of the communication in a condensed form.

In recent treatises on chemical physics may be found tables of the calorific equivalents of various elements. These tables show the amount of heat evolved in the union of various pairs of elements. This heat is commonly known as the heat of combustion. One gramme of hydrogen (H), burning in chlorine (Cl), evolves 23,783 units of heat. This amount of heat involves, indicates, or represents a certain definite amount of force which was used in its production. This force has been designated chemical affinity, and is often supposed to be a species of attraction. The heat of combustion is a measure of chemical affinity.

The heat of combustion has been supposed to be the result of a collision or clash of atoms; the atoms are brought together by an attractive force, and on the collision, the movement takes the form of heat. Is affinity an attractive force, and does it obey the laws of gravity, and other forces of attraction? Is affinity proportioned to mass, and does it vary inversely as the square of the distance? Attraction implies condensation, a phenomenon which does not necessarily take place in chemical unions, and if affinity were like gravity, the force being proportioned to the mass, the ordinary numbers of the chemical equivalents would express its distribution among the elementary atoms. Can the force which the heat of combustion represents be divided among the atoms, and if so, what is the portion of each? Of the 23,783 units of heat involved in the combustion of H in Cl, how much was due to the H, and how much to the Cl? What is the potency equivalent of H, and what of Cl?

It has been found by experiment that if three metals, A, B, and C, be so related that A is capable of displacing B and C from their combinations, and B is also capable of displacing C, the heat developed by a substitution of A for C will be exactly equal to that developed in the substitution of A for B, together with that developed in the substitution of B for C. From this and other similar facts, the author infers that each free atom is endowed with a definite and constant potency, which exists in it as a latent force, and which assumes the form of kinetic or effective energy only in the act of combination, when it appears, and is measurable as heat. The author has constructed a table of atomic potencies by the following process: Let A, B, and C, be three elements, and let their respective potencies be represented by x, y, and z, expressed in terms of heat units. Then from experimental data we have x+y=m, x+z=n, y+z=o, from which the values of x, y, and z, are easily determined. The numbers, however, thus obtained, as true representatives of the dynamical value of atoms, are not altogether satisfactory or consistent with each other. The available experimental data are, at the present time, insufficient in amount and accuracy for a determination of numbers with that exactness which is demanded by scientific men. But a study of the table in its imperfect form suggests entirely new paths of research, and will assist in the comprehension of facts already known.

As an example of the application of this dynamical theory, the following illustration will suffice: In the union of H and Cl, the potency or energy of the atoms appears and escapes in the form of heat. After the union, they remain together by virtue of a sort of atomic inertia. To decompose the HCl (hydrochloric acid), the lost potency must be restored; the decomposition involves the same amount of force as the original act of union. If zinc (Zn) be added to HCl, and takes the place of H, then Zn must give up its potency, and H must resume as much as it lost in the original union. The H is eager for that which the Zn seeks to give; the force passes directly from the Zn to the H, and the Cl is throughout impassive. It happens that Zn has an excess of potency above the H, and this excess escapes with the H in the form of heat. This view of the case is well confirmed by experiment.

Again: suppose a plate of Zn and of platinum (Pt) be immersed in hydrochloric acid, a condition of things which may be represented thus: Pt, H Cl, H Cl, H Cl, Zn, and which, moreover, is a type of a voltaic circle. The Zn being pure or amalgamated, does not combine with the contiguous Cl. But yet there exists an affinity between them. Also, there is an affinity between the Pt and the contiguous H. There is a pull on all the Cl toward the Zn, and of the H toward the Pt Moreover, the H at the right is held in a sort of suspension between the atoms of Cl on each side of it. The word polarization well expresses this peculiar relation of the atoms. The Zn is on the point of giving up its potency, and the H *contiguous to the* Pt is ready to receive it, but there is no path between the two which the potency can take. Now, in this condition of affairs, let the Zn be connected with the Pt by means of a metallic wire, and the potency of the Zn passes over to the Pt, and through the latter to the contiguous H, which now asssumes its elementary form. The Zn being freed from its potency, unites with its neighbor, Cl. The passage of the potency along the wire is what we call electricity. The excess of what the H needs to exist as an element, takes the form of heat and escapes, and it is this excess which measures the amount of useful work which can be obtained from a battery in practical operations.

If this electrical theory be true, it appears that there is but one kind of electricity, and that in the battery it moves only through the wire, and not through the liquid. It will be observed it is from the Zn to the Pt, while the old theories make the course of the so-called positive current in precisely the opposite direction.

The author here gave an interesting speculation concerning ozone. It has recently been determined that ozone is an allotropic form of oxygen, differing essentially in the fact that it has a greater specific gravity. Oxygen, in separating from a compound, rises to its ordinary form by two lifts or stages. First as ozone, then as oxygen, the latter containing and requiring an addition of potency. The battery, therefore, which is economical of its force, sets free the oxygen in the decomposition cell only as ozone, and thus it escapes; the potency which is required to raise the ozone to the form of oxygen must come from other sources. When oxygen is set free from combination at a temperoture below 300°, it probably always takes the form of ozone. Also, it is likely that the hydrogen escapes in a condensed form on the surface of the platinum, and provided as much of the energy of the battery is taken away for outside work as possible, the hydrogen takes up heat from the platinum and the solution which it needs to exist at the ordinary tension and temperature.

If this theory should prevail after it has been submitted to the scrutiny of the scientific public, it will bring about a radical change in our notions of chemical phenomena. It reduces chemistry to a branch of mathematical philosophy, and makes properties and changes of properties of matter, only cases of positions and motions of atoms.

Correspondence.

The Editors are not responsible for the opinions expressed by their correspondents.

Cipher Writing---A Universal System.

MESSRS. EDITORS:—So much has recently been said in the columns of different newspapers throughout the country on the subject of "Cipher Writing" and "Deciphering," I have made bold to request a limited space in your valuable sheet for the purpose of ventilating a few ideas of my own on this much discussed question. The late comments on this subject have arisen partly from a story recently published in *Blackwood*, in which cipher writing is indulged in by one of the characters, and the art of *deciphering* by another. The story itself is not pertinent to the question, other than the remarks of the hero in explaining his theory of the art of *deciphering* any *written* words in *cipher*, and he is not the only one who has asserted that *any* written cipher can be deciphered, and this belief has spread itself through hundreds of newspapers influencing their thousands of readers. As a late editorial justly remarks, "If the whole system of cipher writing can be unlocked by other means than the key, its extension and use as practiced at the present moment by thousands of business men and others in the transmission of valuable telegraphic dispatches regarding stocks, gold market, merchandise, police matters, and the secret business of the general government, is of but little account, and anything but a safe medium to transact business requiring absolute secrecy, from all but the person or persons intended, and may account for some strange developments in civil as well as military life." Now, all this may be true as applicable to any ordinary system of cipher; and the writer in *Blackwood* is undoubtedly correct in his explanations of how to decipher any cipher writing in common use; but I must beg him to make *one* exception in favor of a system of "ciphers" of my own invention, that I am confident will baffle the keenest wit that ever lived to decipher without the key. It is the simplest of all ciphers, because it requires *no written* key to understand. The key is carried in a person's mind, and *can't* be forgotten, because of its perfect simplicity; or it may be varied at pleasure, and the key be found *anywhere* in the Christian world, but useful only to those for whom the cipher may be designed. Another feature about this system is, that no matter how extensively its principles might be understood, any two or more persons could intelligently understand each other either by letter or telegraph, without the least danger that others in possession of its secret workings could be any the wiser had they *years* to study an intercepted sentence, unless it was so designed by the person sending the sentence, for the reason that it is susceptible of an infinite number of curious variations. I will now, with your permission, give a short sentence in this queer cipher, with the English of it underneath, and following which I will give a second sentence in the same cipher, and invite the most astute wit to decipher the second line, although with an example before him, each cipher rendered into English, and containing almost every letter of the alphabet—at the same time assuring all that the second line is as simple and easy of rendition as the first; and, though it may not seem so, yet is deciphered by the same key as the first line, when in the hands of one who not only understands its principles, but for whom the sentence is designed:—

Cipher—2 3, a, 44 9 6 4 1 2, B, 27 15, C2, B, 2, a12 13 14 15, C1 6 3 7 4, D11, G2 10 3, I30 6 26 4 25 10 26 31, H1 2, I1 30 31 3, K5, I, 30 10 11, K5 7, M5, K1 3 4, I29 10 30, 6 7 a38.

English of above—"Washington came first—just, virtuous, brave, devoted, kind, loving."

Sentence to be deciphered—2 4 a1 2 25 23 5 27 13 13 17 16 7 7 9 38, E, 34 30, F9.

A glance at the above lines will show that the ciphers in the first line, with their English letters to correspond, do not make sense when applied to the second line, and herein is the mystery. On counting, the reader will find three more figures in the first line of ciphers than there are English letters in the explained sentence; and I will so far explain as to state, that the ciphers, 2 3, a, do not belong to the sentence, properly speaking, but are explanatory of the key—the first proper cipher letter is the figure 44, which stands for W.

Now, let some of the readers of the SCIENTIFIC try their skill at the last sentence, and give a satisfactory elucidation of it, and the proper key if they can, and, when all have failed (as assuredly they will), I will, with your kind permission, in another issue, make the whole matter as plain as daylight, and furnish a cipher that will baffle detection.

Troy, N. Y. C.

How to Manage Kerosene Lamps.

MESSRS. EDITORS:—I herewith communicate my "say" on the "Kerosene Lamp Question," which is founded on experience and actual experiment.

If the brass-work, cone, etc., is heated unusually hot, it will cause gas to generate in the lamp, which, as it produces pressure, will force itself up through and around the wick and ignite, causing the lamp to sputter, and even snap itself out. Now if, when it is "sputtering" the brass-work is cooled off, for instance, by wrapping a wet cloth around it, the lamp will cease sputtering and snapping and burn as it should.

An examination, while operating as above, will generally reveal charred and saturated wick burning around the base of the wick tube, or the flame of the lamp may impinge on the cone, owing to its being slightly turned or the wick having a ragged corner, causing the brass to heat and generating gas. Low proof oil, forming gas at a low temperatue, is consequently more unsafe to use. If the wick fits the tube properly, blowing down the chimney is the best way to extinguish it, for the following reasons:—It is perfectly safe, the wick need not be trimmed for several days, thus obviating the necessity of regulating it every time it is lighted. A slight puff or a gentle flirt of the fingers across the top of the chimney, in an upward, slanting direction is all that is necessary. A tremendous and badly aimed blast is generally used, where a mere puff would suffice, if properly directed.

If the wick fits the tube, it is impossible to drive the flame down into the lamp by blowing into the chimney.

EXPERIMENTER.

Port Henry, N. Y.

A Proposed Flying Machine.

MESSRS. EDITORS:—I have heard whisperings of flying machines and other novelties of late—whether proceeding from Mr. Glaishere's new society, "*in nubibus*," I cannot say—but if anything of this kind is to be accomplished, my impression is we shall hear of it first from our side of the water; and, if you will permit me, I will give a brief outline of an idea that has occupied my mind, and which may be worthy the attention of parties interested, on taking to themselves wings. It seems hopeful to me, that, as we can support our bodies in the water, by two inflated bladders fixed across the chest, and over the shoulders, leaving our arms free for all necessary movements, so we might, in like manner, suspend ourselves in the air by the aid of a small elongated balloon filled with hydrogen gas, attached by a light frame of cane or wicker work fitting to the figure, and secured by strappings of stout linen, leaving the arms at perfect liberty to work the wings or other contrivances for progression and guidance — the wings made of strong fine silk, smoothly stretched over whalebone frames, capable of extension and retraction at pleasure. But in order to facilitate the operations of the wings, certain mechanical movements will be needful; and these I would propose to inclose in a kind of cuirass of the lightest of metals (aluminum), closely fitting to the chest, and which the arms and hands can completely command. The hydrogen gas is easily obtained from refuse iron and sulphuric acid, which can afterward be converted into a green vitriol. Experiments at trifling cost can be made to ascertain the volume of gas and size of balloon required to poise the body safely and easily in the air; and I am very sanguine that the success of progression and steering will eventually be perfected by some one of your clever correspondents.

I dare not trespass further, either on your patience or your waste basket, as that may be. Fluttering about over the chimney pots, on gaily gilded wings flashing in the sun, will be a pretty sight; but mounting over high precipitous rocks or rivers, would save our thews and sinews, and, may be, our lives; and one apparatus would be of easy conveyance and of small compass.

For reconnoitering and prospecting purposes I think this plan might answer well. THOMAS INGLE.

The Velletta, Ensworth, Hants, Eng.

A Correction.

MESSRS. EDITORS.—I perceive that owing to a mistake in copying, a serious error occurred in the article, Volumetric Estimation of Barium page 244 of issue of Oct, 19, the sentence reading: "If a crimson coloration is produced add liquid from the burette until only a slight crimson tint is produced;" should have read: If no coloration is produced, cautiously add liquid from the burette until a crimson tint is perceived on testing with nitrate of silver in the manner described. Please insert this in your next issue and oblige,

GEO. H. MANN.

Troy, N. Y.

That Big Saw Again.

MESSRS. EDITORS:—I notice a communication in Vol. 17, No. 13, of the SCIENTIFIC AMERICAN, dated Sept. 18, 1867, under the signature of Lamar Foss. Your correspondent attributes to me a statement which he cannot show in any written or printed paper from me viz.: "that a 15 horse power will driv a 52-inch saw of my make as hard as it can be driven." have never made any such statement.

Forty horse-power can be expended in running a 52-inch saw of my make and the saw can be made to cut 40,000 feet of inch lumber in ten hours with that power. Furthermore, I am prepared to demonstrate by actual trial that with a twenty horse-power well applied and a saw of my manufac

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ture well kept in order, I can saw 25,000 feet of inch lumber in ten hours from good clean pine, poplar, or hemlock. In the hard, gnurly native timber of Connecticut, or in the muddy, gritty timber so often floated there a saw cannot be expected to work to one half its capacity.

What some men call 15 horse-power will not rate 10 horse-power taking into consideration the way it is used; *i. e.*: the horse-power as estimated by Watt, 33,000 lbs. raised one foot per minute. I have seen steam engines and boilers rated at 40 horse-power that were so miserably set up and worked that 10 horse power could not be obtained. The quality of fuel generally used in saw mills will not generate the greatest amount of steam, and consequently greater heating surface is required in the boilers or there is a deficiency of steam. Among the various kinds of water wheels in use, many are greatly over-rated in power. Judging from my own experience not one power in fifty, either steam or water, is ever tested; it is nearly all guess-work.

At Sandy Lake, in Mercer county, Pa., is a mill which I erected and in which I put the first of my saws ever run this side of the Rocky Mountains. The size of boiler is 12 feet long, 3 feet in diameter, two 12-inch flues; the engine, 7-inch cylinder, 10-inch stroke. I never carried over 90 lbs. of steam. No one would rate that engine over ten horse-power. The mill has an upper and lower saw 56 and 42 inches in diameter, and sawed the first year over 2,000,000 feet of lumber running only 10 hours in the 24, and has sawed more than 1,000 feet per hour of inch boards.

I am prepared to prove to your correspondent my assertion, viz.: a mill will cut 1,000 feet of inch lumber to the horse-power in ten hours. I assert that a 15 horse-power properly worked with a 52, 54, 56, or even a 60-inch saw will drive the saw to do a good business. Much, of course, depends on the quality and condition of the timber. J. E. Emerson.

Lifting Pumps and their Pipes.

Messrs. Editors—On page 211 current volume, Mr, Wm. Edwards says your answer to A. T. of Kansas was erroneous; assuring your Kansas correspondent at the same time that "a pump in such a situation would suck water considerably more than 23 feet." With proper qualifications the assertion is true, but under ordinary circumstances it will not work.

I have made pumps, and experimented frequently with reference to the proper length for suction pipes; my conclusions are that unless the channel or bore is enlarged as their length is increased they will not work when 31 feet long, which would be the length of A. T.'s suction unless he continued his eight feet depth dug at the mill to the river bank. Add to his 31 feet hight 100 feet length and he would have 131 feet suction pipe. Dig a channel from the mill to the river and his suction pipe would then be 123 feet long; under ordinary circumstances neither lengths would work. Suction pipes of pumps are usually made with a 2 inch bore. In a length of 123 feet the friction against the sides in consequence of the rapid flow of the water through the long narrow channel would be so great as to stretch the water out into a very meager stream, or breaking with a loud report before it reached the valve chamber, defying the most ingeneous to make it work without an increased bore. But, make the bore of the pipe say 4 inches for the upright part and 3 inches for the horizontal length, with joints perfectly air tight, and in my opinion the pump will work satisfactorily and Mr. Edwards' assertion be true. J. W. Shaffer.

Sterling, Ill.

If our correspondent will again refer to the page and paper to which he calls attention, and read carefully the article on which the criticism is based he will find that the advice there given is suitable for him and that the position of this paper is correct.—Eds.

Paris Academy of Sciences.

At the last sitting a paper was received from M. Soret on solar radiation. The actinometer he uses consists of a thermometer with a blackened bulb, and enclosed in a blackened box. The latter is pierced with a hole two centimeters in diameter, admitting a ray of light which falls on the bulb. The temperature of the thermometer continues to rise until it looses by radiation or by the action of the ambient air as much heat as it receives from the sun. In order to protect the thermometer from the influence of extraneous warmth, the blackened box is surrounded with melting ice. From a series of observations made with this instrument it appears that the moisture of the atmosphere influences the intensity of direct solar radiation; and in general, other circumstances being the same, the more aqueous vapor the air contains, the less intensity there is in the radiatien of solar light. Radiation increases with altitude, but its increase is less rapid than the fall of the barometer. The density of the atmosphere being the same, the radiation observed at a great altitude is undoubtedly stronger than at a lower one, and the diminution of radiation as the sun inclines towards the horizon is much less at a high altitude than in the plains.—M. Robb sent in an article on chloride of lime, showing: 1, that all acids displace hydrochlorous acid in liquid chloride of lime; 2, their action ceases then if the hyporchlorous acid set at liberty is not in contact with hydrochloric acid or some oxidable acid; 3, that if the contrary is the case, chlorine is evolved; 4, and that at all events hypochlorous acid excersises no action on chloride of calcium. In a paper on the electric spark, M. F. Lucas calculates that while the voltaic focus now used for lighthouses is equal to the light of one-hundred and twenty-five Carcel lamps a solitary electric spark, having but an apparent intensity of ons-twothousandth of a Carcel lamp, would be seen from a greater distance than the voltaic light above alluded to. He therefore recommends the periodical discharge of strong batteries of Leyden jars instead of the permanent lights now in use.

American Champaigne in France.

One of the most interesting manufactures of the American Department of the Paris Exhibition is that of the still and sparkling wines, colored and uncolored, which are exhibited by a score of American wine manufacturers. These wines, after being tested by the best judges, have been pronounced worthy of being compared to the most prized productions of France. These sparkling wine comes near to the champaignes of the best marks—"Reims," "Epernay," and "Chalons"—and this American manufacture is coming strongly into competition with our own products in the markets of the new world. The grapes which yield this product are the Catawba, the Isabella, the Delaware, the Diana, the Virginia, the Seedling, etc. Six specimens of these sparkling wines have been pointed out by the jury. In the first line stand the samples of Messrs. Werk & Sons, of Cincinnati, Ohio. We understand that in their wines the best qualities of grapes and finest of crystallized sugar are used, and the same skill employed as in the manipulation of the best manufactures of France. Mesers. Werk, being natives of France, are acquainted with all the minutest details in the cultivation of grapes and the production of wine. The elder Mr. Werk was one of the first promoters of this branch of industry in the United States. Their vineyards are located near Cincinnati.

[We translate the above from *L'Invention*, an excellent monthly journal of science, published in Paris by Charles Desnos. We are much pleased to record this strong commendation of a comparatively new branch of industry in our country, but which has already become very important. There is no good reason why we should depend upon European nations for our supplies of wine, and we think the importation in this branch must gradually decrease, although statistics show the consumption to be greatly increasing.

Eds.

Shell Cameos.

The shells employed for cameo cutting are the cassis rufa, and several species of cyprea, called cowries. They are dense, thick, and consist of three layers of differently colored shell material. In the cassis rufa, each layer is composed of many very thin plates, or laminæ, which are perpendicular to the plane of the main layer; each lamina consists of a series of elongated prismatic cells, adherent by their long sides; the laminæ of the outer and inner layers are parallel to the lines of growth, while those of the middle layer are at right angles to them. In cowries there is an additional layer, which is a duplicature of the nacreous layer, formed when the animal has attained its full growth. At the London Exhibition there was a very fine collection of shell cameos, from Rome, owned by the engraver Seculine. Certain natives of India prepare shell cameos with rude but efficient instruments for cutting them, and the Indian department in the Exhibition showed numerous specimens.—*Dr. Feuchtwanger.*

A Cement for Iron and other Substances.

A correspondent asks, "What is the best known substance for sticking sheepskin to iron." We reply, that any fibrous material can be "stuck" to metal, whether iron or other metal, by an amalgum composed of glue dissolved in vinegar, hot, with one-third of its volume of white pitch pine, also hot. The composition will give a sure and certain return.

Editorial Summary.

Elementary Education in France.—One third of all the inhabitants of the French Empire are unable to either read or write. This unwelcome fact has just been forced upon the attention of the enlightened among that nation by the publication of two maps entitled "France that can read, and France that can write." In the latter, the districts in which persons married in 1866 who could not sign the registry—in a proportion varying from thirty to seventy per cent—are marked in black. Fifty-five departments thus denounced comprise all the south, center and west of France. The averages of the illiterate married in 1866 is thirty-three per cent. As regards primary instruction France accordingly is in the lowest rank of the European powers.

Tailless Cats.—A correspondent in Sudbury, Mass, informs us of the existence of a race of felines in that vicinity all of whom are destitute of caudal appendages. Tradition ascribes their origin to a farm where many rabbits were kept, and a mixture of races was the consequence. In confirmation of this Darwinian idea onr correspondent asserts that the tailless cats of the present generation have the crook of the legs and the jumping gait, characteristic peculiarities of the rabbits. A frightful mortality in every litter of these curiosities tends to prove that by an unnatural effort nature has produced this mongrel race. The generous offer of our correspondent for an editorial cat of this family is gratefully accepted.

Whooping Cough Infectious.—M. O. Poulet read at a late meeting of the French Academy a paper with this title, in which he stated that during an epidemic of whooping cough which prevailed in his neighborhood, he found in the air expired by a number of children suffering under it, a vast number of infusoria, identical in every case, and which had the property of communicating the disease to persons inhaling them.

Profoundly Impressed.—It is reported that during the visit of Abdul-Aziz to the Paris Exposition, he inspected the greatest triumphs of science and art with an air of dignified repose, which was in fact the stupid tranquillity of ignorance. The only thing in the building that caused a smile of intelligence to pass over the Sultan's face was a punching machine in full work, and when told by his interpreter that it was capable of administering one thousand punches a minute, he replied with decided animation that he would take one home with him for the benefit of the heads of those who had persuaded him to leave Turkey.

The Aeronautical Society of Great Britain contemplate holding an exhibition in May, 1868, of machinery and apparatus relating to objects of an aeronautical character. There are several expensive designs for the accomplishment of aerial transit at this time under construction. It is proposed to offer a prize to any aeronaut starting from any part of continental Europe who shall reach England in a balloon nearest to a given point without replenishing his gas at any time during the days of reception allowed for articles of exhibition.

Another New Motor.—An English patent has just been issued for an invention for employing gaseous hydrochloric acid to work on a piston and to produce motion. The gas is evolved from its solution by means of sulphuric acid and after it has done its work it is condensed by transmission through water, then, being liberated from the water by evaporation, it may be used over again any number of times. The parts of the apparatus with which the gas at any time comes in contact must be made of, or coated with glass, to prevent corrosion.

Musical Anthropology.—M. Ketis, of Brussels, has collected an immense amount of documents on the music of the greater number of modern nations, which have enabled him to divide them into several well-defined groups. From the models of flutes and lyres furnished by the pictures on Egyptian and Assyrian monuments, he has constructed instruments with which he has been able to revive musical systems buried for thirty centuries. He hopes from these systems to distinguish races as they have been previonsly recognized by languages; only less precisely.

The Remedial Properties of Grindstone Grit.—It is a common notion that the grit of the grindstone has some wonderful quality of healing which does not obtain with the sediment of ordinary stones on which iron is not used, as millstones. There is reason in this opinion, as the *debris* of the grindstone is a mixture of silica and ferruginous oxide. The healing properties of the *debris* of the grindstone lie in the oxide of iron, which, in this form, in some diseases is worth many medical prescriptions.

Compasses for Iron Ships.—The late M. Evan Hopkins has proposed a new plan for remedying the deviation of the compass needle in iron ships, his object being first to neutralize or destroy the polarity acquired by the iron ship while building, and removing the compass from the sphere of attraction exercised by the iron of the vessel. A horseshoe magnet is to effect the first object, and elevating the compass to a sufficient hight is to accomplish the other. He proposed to place a reflector near the elevated compass, in such a way that the card may appear like the face of a clock, and be capable of being read at the distance of twenty feet from the helm.

Poisoning by Phosphorus.—M. Dybkowsky, in a recent memoir states that the poisonous action of phosphorus is entirely due to the formation of phosphoreted hydrogen gas, which, in passing into the blood, rapidly combines with the oxygen present. Hence he concludes that death from phosphorus is nearly equivalent to death by asphyxia.

A comic paper called the *Philosophe* recently appeared on the streets of Paris with a large portrait of Bismark, representing him as an ogre in the act of sharpening a knife to devour little children. The sale was prohibited and the police seized all they could find. Bismark is not much loved in Paris, but he is more feared than any other man in Europe.

Correction.—In our answer to H. L. W. of Pa., on page 263 No. 17, present volume Scientific American the matter reads that the grate surface of a boiler per horse power is "six square inches." It should have been "half a square foot," a mild difference of only 66 square inches.

Spontaneous Combustion.—A fire recently occurred in the woolen mills of Messrs. Annens and Minot at Elbeuf, France, which was caused by the spontantaneous combustion of a heap of refuse wool impregnated with oil. The Scientific American has frequently warned manufactures of this source of danger.

Player's Patent Hot Oven, illustrated in our paper a few months ago, has been put into practical operation in this country with great success by Horace L. Brooke, of Baltimore, Md. The use of this oven is said to effect a clear saving of $10 a tun in iron smelting.

Dr. R. J. Gatling, inventor of the celebrated Gatling gun, sailed for Europe on steamer *Pereire*, Oct. 19th.

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American Toys, where Made.

A writer in the *Commercial Advertiser* has been investigating the business of making various kinds of toys, with the following result:

"The tin toys used in this country are now nearly all made in Merriden, Conn., where large quantities of tin household goods are also manufactured. It occurred to the makers of these latter that their scraps could be advantageously used for toy objects, and with the advantage of labor-saving machinery, they have driven their German rivals from this market.

Wooden toys of the less fragile kind are largely manufactured in several Connecticut towns. These consist of children's wheelbarrows, drums, rocking-horses, carriages, carts, blocks, rail cars, hoops, sleds, etc. Many of these objects are also made in this city and Philadelphia.

The new sensation toys, as the dancing negro of a few years back, and the present returning ball and Quaker popgun, are all made here. The patentees of these articles are said to have made fortunes. The railroad train and several other new toys, in great demand when first presented, have also been mines of wealth to those who patented them. The red india-rubber balloons are made in France, and filled here with gas. They are by no means strong, and the gas soon escapes.

Pewter toys, comprising soldiers, landscapes, trees, etc., are now largely made in this country, and though many are yet imported from Germany, their manufacture continues to be a profitable branch of business. New York monopolizes much of this industry. An Italian firm during the war realized a considerable sum by the manufacture of toy tea cups and saucers, the chief material of which was lead.

The stuffed bodies of dolls are made in New York, Boston and Philadelphia, as also the arms; but Germany still sends many. The arms of stuffed dolls are an especial article of commerce. They are not, like the legs, attached to the bodies, but are sold separately. Families will often make the bodies and legs for their children, but buy the arms on account of the difficulty of making fingers. The heads are likewise purchased, and are either of French porcelain and finely featured, of German china or papier mache, of English wax, of American india rubber, or of a new imitation of papier mache lately patented in Philadelphia. This latter is of thin layers of muslin, coated with oil paint, which has the advantage of washing without injury and is exceedingly strong, though by no means of fine finish.

India rubber hollow toys of every description, except balls, are said lately to have drooped in sale. Grotesque birds and men that squeaked when squeezed, seem to no longer to charm by their music.

The india rubber dolls' heads, lately much in use, are superseded by the new Philadelphia article spoken of.

Large mechanical toys, such as velocipedes, imitation steam engines, steamers, etc., are made here; as also kaleidescopes. A negro jig dancer, propelled by steam, is the latest Yankee notion. A kerosene lamp heats a small brass vessel full of water and shaped like a top. It revolves in its socket, and moves a wire which communicates with the figure.

Aside from those we have mentioned, and a few others, most of the objects seen in a toy store still come from Germany. Children are largely employed in their preparation there, but American children go to school. It is surprising at what an early age German children are availed of in this respect. At six years, there, certain simple duties are performed by them upon portions of toys. Farmers of two or three acres employ their entire families in toy making during the winter months. The result of this labor is seen in Noah's arks. A youngster of very tender years paints the bodies of Noah's family and the animals with one color, and another child, a little older, dots the artistic countenances, or daubs patches of varied colors on the bodies. Wooden dolls are mostly made in Germany by the country people. Marbles come exclusively from Saxony, and are prepared in molds by machinery, from a clay not found in other countries. The material for agate marbles is obtained in the Hartz mountains of Germany.

A Japanese top has been lately in vogue, and several Chinese toys have been for years in use. It is worthy of notice that the hints for toys manufactured for generations past in Germany have been usually taken from China.

Croquet instruments are made in Pawtucket and Providence, Rhode Island, and in Boston and Springfield, Mass.

Maple is the wood principally used, though lignum vitæ is sometimes employed. For most expensive kinds boxwood is the material. This has become an immense business, and is likely to continue so, as croquet is yet by no means as common a game in the South and West as in the East. Small balls, for parlor use during the winter months, are also made. The new game of martelle employs the same woods. The parlor balls are of ivory.

There are few better or less explored fields for fortune than the invention of toys, and ingeniuty seems constantly drawn in that direction."

[The number of applications for patents in toys, during the past few years, has been gradually increasing. We never knew a patentee of any kind of a toy that did not make money out of his patent.—EDS.]

Marmalade.

A paper was read in the British Association on the "Confectionery and Marmalade Trade of Dundee"—a trade which has been in existence for seventy years. Some curious facts were stated which we copy:

The quantity of marmalade made in Dundee at the present time amounts to above 1,000 tuns annually, for the production of which more than 3,000 chests of the finest bitter oranges are used.

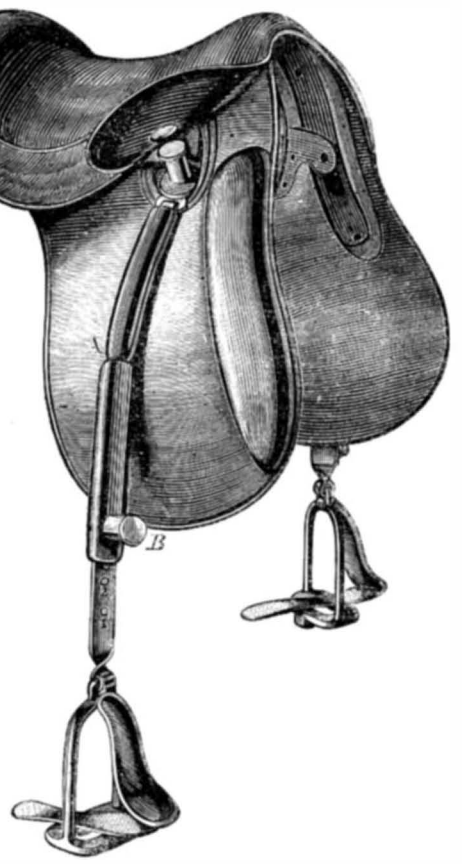
These are imported from Seville, as it has been found that the oranges grown in and around that city possess a peculiar and agreable aroma, which renders them better adapted for the purpose than those of any other district either in Spain or Italy. When the marmalade is prepared, a sufficient quantity of sugar is added, to preserve it thoroughly, without in any degree impairing the flavor. About four hundred persons are directly employed at the Dundee confectionery works, and it may be added that occupation is furnished to many more in connection with them. For example, one of the Newcastle potteries is to a large extent employed in turning out the well-known printed jars for marmalade. Of these there are about one and a half millions required every year, costing upward of £6,500. The marmalade season, as it may be called—that is, the period during which all that is required of this preserve for the year's supply must be made—usually continues about four months, viz., from the begining of December to the end of March.

The manufacture of confections is also carried on on a very large scale, and embraces an immense variety of lozenges, comfits, candied peels, etc., to supply the constantly increasing demand both for the home and colonial markets. The quantity of sugar, chiefly refined, used for the confections, marmalade, and preserves made in Dundee, it would be difficult to estimate; but it probably amounts to two thousand tuns annually.

By way of giving a scientific term to the paper, the writer stated that "the word 'marmalade' is supposed to be derived from an Indian fruit not unlike the orange, called the *Ægle marmelos*, or Indian *bael*, from which at one period, a similar conserve seems to have been made."

MEYER'S SAFETY SADDLE.

The object of this saddle appears to be not only to make an easy seat for the rider and a comfortable appliance for the horse, but to insure safety, in case of the fright of the horse,



to his rider. The contrivance seems to be well adapted to these ends. The frequent accidents occurring from the entanglement of the foot in the stirrup, the fatal consequences of being drawn by the foot, as was Achilles by Priam, seem to demand some arrangement by which the rider can extricate himself from a very bad situation.

The saddle in the engraving is made to fit the horse, the frame being of iron instead of wood. But the improvement is mainly in the appendages to the saddle. The stirrup strap is in two parts and connected to the saddle proper by means of a metal strap secured in the leather of the strap proper, and held in place by a spring catch, seen in the engraving under the saddle flap. The strap is in two parts and swiveled at A, so that it may be turned in any direction. At B is another spring catch which allows of a raising or lowering of the stirrup. By the use of the upper catch the stirrup strap may be instantly disengaged, so that if the rider is in danger of being thrown he or she may disengage the strap to prevent being caught when thrown or leaping from the horse. The stirrups are hinged to accommodate themselves to the action of the foot. It was patented through the Scientific American Patent Agency Sept. 18, 1867, by Jacques Meyer, 104 Ewen st., Williamsburg, N. Y., who will answer all inquiries relative thereto.

A Shaft in the Oaks Colliery.

Number two shaft is in a condition different from that of number one. Great timbers secure its sides, and the eye can penetrate it but to a very little distance. This is the mainway to the workings, and was with immense labor choked up and stopped soon after the calamity. But what is going on in the great mine is not left entirely to be guessed at. Penetrating the mass of material used in blocking the shaft, is an iron pipe of the circumference of a dessert plate with a secure groove-lidded top. This extends right down to the subterraneous ways where are still entombed three hundred human beings and forty horses and ponies.

The object of this pipe is that the gas in the terrible place may be measured as to its strength and quality, and to this end outside the big pipe there is affixed an indicator, and every hour note is taken of the pressure shown, and entered in a book. This is part of the night watchman's work. "I should imagine that the gas must have been well nigh exhausted by this time," I remarked. "You never were more mistaken; coom up here and see for yoursel'." was the obliging reply. "Up here" was up a short ladder, and after depositing his lamp ("safety" though it was) at a considerable distance, my guide led the way. I did not see him take the lid off the pipe, so I cannot explain how it was done, but I knew the moment that it was done by the strong blowing. "Put oop you han' mon, and feel it." This I did, and whistling through my fingers the foul blast made them feel as though webbed. "Put thy face ower mon—just a instant; keep thy mouth shut." And this, blockhead that I was, I likewise did. It was only for an instant, and without doubt I shut my mouth. But where was the use of such a mild precaution against so insidious an enemy? I must have closed every pore of my skin to have escaped its poisonous influence. I paid the penalty of my rashness. Breath of death as it was, it crept into me, and not that night nor next day but the day following, it roused in its lurking place, and, alas! the twisting it gave me! I never yet was seasick, but if that affliction is a tenth as horible as mine-gas sickness, commend me everlastingly to the land.—*James Greenwood.*

Europe on the Western Hemisphere.

It may be interesting to know what territory in this hemisphere is claimed by European nations. The *Hartford Courant* says: The European nations owning territory in America are six in number—England, Spain, France, Holland, Denmark, and Sweden. To England belongs all the territory north of us known as British America, as also the Bermudas, the Bahamas, Jamaica, several small West India Islands, English Guiana in South America, and the Falkland Islands. These embrace altogether about one hundred and fifty thousand square miles and a population of nearly five millions. France owns St. Pierre and Miquelon, a small group of islands off the coast of Newfoundland, Martinique and Guadeloupe among the West India Islands, and French Guiana in South America. The population of these possessions is three hundred thousand. Spain owns Cuba, Porto Rico, and the Spanish Virgin Islands. This last scanty remnant of a domain, which once included half of South America, and a quarter of North America, has a population of less than two millions. Holland rules Surinam or Dutch Guiana in South America, and a few small islands of the West Indian group. The number of their inhabitants is not one hundred thousand. Denmark is in possession of the three West Indian islets of St. Croix, St. Thomas and St. John, with a population of thirty-eight thousand; while Sweden exercises sway over the petty adjoining isle of St. Bartholomew, containing but twenty-eight hundred souls. It will thus be seen that the people subject to foreign domination in the New World does not amount to so much as a third of the population of our country alone. Of the six foreign powers only one, England, has a foothold on the mainland of North America; while only two others, France and Holland, have possessions on the continental portion of South America.

Toads.

The paper on "Toads," in *Harper's Magazine* for October is original and descriptive, and does justice to a much maligned member of the animal creation, for whose bad name Shakspeare and Milton are largely responsible. We quote a passage, which informs us why toads are so cold. The writer says: "The abundant moisture and coolness of the toad, so essential to his health and comfort, help to make him disagreeable to us. As the moist coolness of a dog's nose startles any one who feels it unexpectedly or in the dark, so does the invariable dewy cold and clammy sweat of the tood, when touched, offend many a civilized simpleton. I say civilized, remembering that the black barbarians of Senegal, availing themselves of this perpetual coolness produced by the abundant moisture and rapid evaporation on the skin of toads, are in the habit, as Adamson informs us, of applying toads to their foreheads as they traveled in torrid heats over burning sands, on the same principle that Roman ladies of the imperial age carried cooling pots in their hands and bosoms in the form of living serpents; or that the languid beauties of Turkish seraglios pass between their fingers the refrigerating fragrant beads of their amber tusbecs.

"In every toad there is a sack of pure water, not at all connected with the kidneys, but serving as a reservoir, and furnishing, doubtless, a part of the fluid which perspires from the skin. This fluid is very harmless in the common English and American toads. So, also, is the liquid which is largely secreted by the bean-shaped bunch on each side of the toad's head, as well as that which is so freely ejected when you suddenly grasp a toad in your hands. Most persons are afraid of these fluids, and imagine them poisonous. They are mistaken. Not even Macbeth's weird sisters could now find venom in the common toad. It is true, however, that these juices have a slightly irritating effect when applied to the eyes, or to a flesh wound, and that cat or dog does not like to take a second taste. But they are substantially harmless."

COMPOSITION OF BRITANNIA METAL.—Ordinary Britannia metal is composed of equal parts good red brass, antimony, tin, bismuth, and lead.

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PROGRESS OF THE PACIFIC RAILROAD---THE SYSTEM ADOPTED FOR LAYING THE TRACK.

A correspondent of the *Evening Post*, writing from Omaha, under date October 11, thus describes the progress of work on the great Pacific Railroad and the mode of laying the track.

To the people of the East the Pacific Railroad, building thousands of miles away in a desert country, and meeting obstacles only to overcome them is a great enterprise ; but to the western man it is the one great topic of conversation. In fact, almost every man here is in some way personally interrested in it, either actually working on the road, or getting out ties, or cutting cord wood, or in some one of the numerous contracts connected with it.

THE DIFFERENT PACIFIC RAILROADS.

Here is a Union Pacific and a Central Pacific, and a Union Pacific Eastern Division, and a Northern Pacific, and a Southwestern Pacific. Of these the Union Pacific, and the Central Pacific are the great Pacific Railroad we read about, and when completed will form one continuous line from Omaha to Sacramento. The Union Pacific has already completed nearly five hundred miles west, commencing at Omaha and the Central Pacific is in running order more than a hundred miles east of Sacramento. They will unite somewhere about Salt Lake City. Both roads have government assistance and both roads have their bonds in market. The Union Pacific Eastern Division, starting from Wyandotte, Kansas, follows the Smoky Hill route, passes through Leavenworth and Topeka, and is now in running order to a point called Ellsworth, about two-hundred and twenty-five miles out.

It is this road that has been threatened by the Indians, and to the building of this that Ragged Shirt Tail and his companions object. This road also receives government assistance, and as now projected will strike the Union Pacific at some point west of Denver, and will be a sort of branch of it. The Southern Pacific, starting from St. Paul is as yet hardly under way, and the southwest branch running from St. Louis to Rolla, and thence by way of Santa Fé, through Southern California to San Francisco, is in about the same condition. The Northern Pacific is not intended to strike San Fransisco, but rather Portland or some city in Oregon, and the Southwest Branch very likely will make some point lower down on the California coast its western terminus. But while these other roads are debating what rout to take, or how to raise the the funds to build the road with, the Union Pacific has thoroughly built and equiped nearly five hundred miles of road, is already within a hundred miles of Denver, and although running through a waste of wildernsss almost uninhabited, more than pays its expenses.

WEST FROM OMAHA.

You get into the cars at Omaho at six in the evening. There is nothing in the passengers to remind you of the extraordinary nature of your trip, unless it is that almost every one has a rifle, and that the conversation smacks of buffalo, and the miners, and fronteer adventures. Comfortable sleeping cars are attached, and when you wake up in the morning we have passed Fort Kearney and are fairely on the Plains. As far as you can see to the right is one broad unbroken expanse of plain. On the left is the Platt with its bluffs, and here and there a straggling willow or cottonwood. But we have passed the region of timber, and shall see no more until we come to the present end of the road beyond Antelope, where on the bluffs a few stunted cedars and pines wrestle with the winds for their existence. The "Plains," in the sense in which the word is generally used, means all that immense tract of country which is without timber and without water. Sometimes this is an immense prairie, level as a floor and covered with waving grass ; sometimes a plane hemmed in on either side by barren bluffs. Rain seldom falls here, and it is only available agriculturally for stock raising. After leaving Fort Kearney no farms are to be seen, but instead, now and then a scared antelope startes up and makes off over the plain, and the immense horns and the bones of buffalo lying along the route show where they have been killed. At Fort Kearney four Englishmen came aboard the train who had been out on a five days' hunt, and had killed fifty buffalo. The tongues they cut out, and the carcasses they left. They did not want the meat, and they only killed them for the sport of the thing. It is just this wanton waste of useful life that so enrages the Indian and excites an anger which is vented on the first white men he is strong enough to overcome.

HOW THE TRACK IS LAID.

Breakfast is over and work commences at half past six, but it is not till seven that it is fairely under way. We shall only see the track-laying to day, for the grading, which is a separate part of the work, is already completed to Cheyenne, thirty miles ahead. The work of track-laying is divided into three parts :—the tie-laying. the track-laying proper, and the bolting and spiking.

THE TIE PLACERS.

First come the engineers, who fix the line of the ties, determining where they are to go ; next a set of skilful workmen who put down a few ties at the proper level, enough to determine the position of the rest of the ties, and finally the great body of the layers, who fix the remaining ties on the level of those already down—workmen follow, throwing in dirt and ramming it down, and all is then ready for the track-layers. These are a gang of ten stalwart fellows, in whose work is the great attraction. Taking an open truck of a car, they run it back to where the rails were dumped off of the supply train, and load it with rails and the proper number of joints and spikes. A couple of horses are then hitched to the car and haul it to the end of the track, when they are unhitched and sent back for another load leaving in their place a small but intelligent horse, that performs his work with great steadiness and zeal.

THE RAIL LIFTERS.

The truck being at the end of the track and the wheels blocked, at a word from the foreman five men on each side seize a rail and pull it out over the front of the car to its full length. "Down," sings out the foreman, and down comes two rails into their proper places on the ties. In an instant the man at the farther end has applied a measure and adjusted the width, the man next the car has whipped out the blocks, the little horse knows that now it is his turn and strains and pulls, and the car runs over nine yards more of the Union Pacific Railroad. "Whoa up!" the horse stops, the wheels are blocked, again two more rails are seized, "Down" cries the foreman again, and down come nine yards more. It is very exciting to watch this work, but you can't keep still. Every fifteen seconds the voice of the foreman rings out sonorous "Down," and every fifteen seconds another set of rails respond with heavy clang. Occasionally a rail comes out that is not perfectly straight. In this case instead of putting it down, one end is rested on the truck, all the men steady it, and a mighty Hercules, seizing a tremendous sledge hammer, deals it such blows as soon reduce it to its normal line.

THE RATE OF BUILDING.

Nine yards in fifteen seconds ! Great heavens, what a pace ! This is thirty-six yards a minute ; nearly a mile and a quarter an hour. At this rate, counting ten hours a day for work, and estimating the distance to Sacramento at one thousand six hundred miles, the work would be done in a little more than four months. But follow the truck along, and you will see why it is that this pace is not kept up, and why two miles a day is about an average of the work. A truck carries thirty rails. It exhausis its load then after dropping fifteen sets of rails, and must go back for another. This is what takes time, for the rails are heavy and slow to be loaded, and the truck must be run back to the point where they were unloaded from the supply train. As the track advances, this point recedes, and the truck must be run further and further back each time until a new load can be dumped off nearer.

This and many other difficulties reduce the track laying to an average of about two miles a day. In September, owing to the want of bolts and spikes, only ten miles of track were laid. The most constant forethought and the greatest energy are necessary to keep always ready rails enough, and bolts enough, and spikes enough, and the thousand and one articles, the want of any one of which would stop the work. And indeed, considering that the iron comes from all over the country, much of it from New England ; that the ties are brought from wherever they can be got, many from Michigan, Minnesota and Wisconsin ; that everything must be transported by a single line of track to Council Bluffs, thence across the uncertain Missouri River in boats, and again five hundred miles to their destination, and that the daily consumption of rails alone for two miles progress is two hundred tuns, and of ties five thousand two hundred and eighty, and of everything else in proportion—considering all this, I say, the wonder is not that the progress is not greater, but that it is as great as it is.

THE BOLTERS.

But to resume : The track laying I have described only leaves the rails in their places, resting there by their own weight. Close behind the truck from which the rails are laid come two men who place at each jointing of the rail a clamp, and at each sleeper two spikes. These clamps, called the Fish clamps, consist of two pieces of strap iron, which are placed lengthwise of the rail and in the hollow of it, and are bolted together by bolts passing through them and both rails. The rails are thus securely fastened together and form one continuous piece of iron. Close behind the clampers come the spikers, who put in enough spikes to hold the rails in their proper position until the main body of spikers come up, when the exact width of the rails is fixed, the sleepers finally settled, and the last spikes driven home—and the work is done. This is the main work, but a dozen branches of it are going on all at the same time. Fifty mule teams are constantly hauling up sleepers, water carts are making constant trips to supply the whole establishment with water. Bridge men, three or four miles ahead, must permit no delay from bridges, and the telegraph must be the *fidus Achates* of the railroad. Every twenty miles a water tank is to be constructed, and wood wherever it can be got must be cut up and hauled for the engines.

The Rocky Mountains are now in sight. Thirty miles further and Cheyenne will be reached, and it is hoped the Black Hills this fall. The winter will then set in so as to prevent further work this year. But next year, when spring opens, it will again go on and with renewed energy. General Dodge, the Chief Engineer of the road, who has just returned from a six months' exploration of the mountains, reports finding an easier grade and an abundance of excellent coal. Already steps are taking to form a new territory, to be called Wyoming, and to be made up of parts of Colorado, Idaho, Dakota and Nebraska. Build the railroad, and the railroad will populate the new territory.

Restaurants of the French Exhibition.

Of the many singular features of the French Exhibition, now drawing to a close, nothing is more striking than the elegant restaurants that surround the building. A certain amount of space was appropriated for this purpose to the various countries that had departments in the Exhibition, and the restaurants were fitted up, supplied and served in accordance with the tastes and customs of these varied nationalities. A Frenchman can get his coffee, wine and bread, a German his beer, sausage and sour krout, a Yankee his sherry cobbler, and pumpkin pie, the Englishman his beef, mutton and pale ale, and so on through all the whole list of edibles which the science of gastronomy can suggest to satisfy the appetite. At midday the work begins, and for two hours the music of crockery and the rattle of knives and forks seems to absorb the attention of everybody.

It is doubtful however if these restaurants have success in a financial point of view. The Paris journals already announce that the chief *restaurateur* of the French Department is a bankrupt, and that his liabilities are $300,000, and there is considerable grumbling on the part of the waiters in some of the others that their wages have not been paid, and a general collapse of empty purses is expected to crown the enterprise.

MANUFACTURING, MINING, AND RAILROAD ITEMS.

The total silk production of California for 1867 is estimated at 210,000 cocoons and the supply of mulberry far exceeds the demand. The business is quite profitable just now, but the silk men are advancing cautiously.

The "swamp angel" which during its service before Charlestown, S. C. gained a great notoriety, is now lying at a machine shop in Trenton, N. J. awaiting its turn to be broken up and fashioned into more peaceful and useful implements.

Fire-clay, rivaling the best deposits of Europe, is found within four miles of St. Louis. The bed is fifteen feet thick and very extensive. Fire brick made of this clay is capable of resisting very high temperatures, and is excellent material for retorts, alembics, crucibles and furnaces.

The Missouri and Mississippi railroad is now under construction. The charter provides for the building of a road from Macon, on the North Missouri railroad, to the mouth of the Des Moines in the northeast part of the State, where a connection will be made with the Iowa system of railroads, and with those of Illinois by means of the road which terminates at Warsaw on the opposite side of the Mississippi river.

The marbles of Vermont have become one of its chief sources of wealth. The quarries and mills near Rutland, supply a large per cent of the marble of domestic production which is used in this country for statuary, monumental and other purposes, where a fine grade is desired. A capital of several millions of dollars is employed in the business, and a large proportion of those who have embarked in it have been in an eminent degree successful.

Among the new manufactures put in operation in San Francisco during the past year, are the Pacific Woolen Mills for manufacturing knit goods at the rate of $500,000 annually ; the Golden city chemical works with a capital of $2,000,000, for preparing a great variety of chemicals and medicinal extracts ; the San Francisco Glass Works for making white and colored glass to the extent of $150.000 a year, and the new Linseed oil and Paint Works, with capacity to supply the whole Pacific coast. These with minor enterprises inaugurated during the same period have absorbed more than $3,000,000 capital and will turn out manufactures to half that amount yearly.

The elevation of Iron mountain, Missouri, is 228 feet and the area of its base 500 acres. The solid contents of the cone are estimated at 230,000,000 tuns.

In Mexico there exist 197 different kinds of minerals among which are gold, silver, iron, copper, lead, zinc, mercury and tin. The following are said to be peculiar to that country : Rhodium, gold silenid of mercury, zochillanite, jalapite, iodyrite, coccinelo, plunbic, silver obsidian, and vanadite.

A British consul in Japan gives a remarkable account of the wealth of the lead, iron and coal deposits in the island of Yesso. In one place coal forms the sea cliffs, and in another he walked four miles over an iron sand which contained over 60 per cent of metal. There are also indications of gold and copper.

A very singular and quite complicated railroad accident, or series of accidents occurred last month on the line between Manchester, (Eng.) and Derby A cattle train of twenty-three cars entering the Peak Forest tunnel came into collision with a gravel train which had preceded it. One life was lost and much damage done, but the mischief did not end here, for both trains were standing on a steep incline, down which the recoil started the remaining cattle cars. An express train was standing on the rails and seeing the trucks approaching, the engineer reversed his engine and jumped off, but before the express had retrograded many rods a second collision ensued, the express train then continuing to back at a furious speed until stopped on an up grade by the loss of steam.

Recent American and Foreign Patents.

Under this heading we shall publish weekly notes of some of the more prominent home and foreign patents.

INDICATOR FOR PUNCHING MACHINES.—W. Welch, Bridgeport, Conn.—This invention relates to a new device by which the number of strokes of punches, shears, milling machines, and all such machines, in which reciprocating motion is generated by rotating motion, can be registered, said device being so arranged that the registering apparatus can be put at rest when it is not desired that the strokes should be counted, as for instance, for lubricating, repairing, and testing purposes.]

MANGLING MACHINE.—Johan Johansen, Springfield, Ill.—This invention has for its object to furnish an improved mangle, simple in construction, strong, not liable to get out of order, and which will do its work quickly and well without injury to the fabric.

HOSE COUPLING.—Moseley S. Curtis, New York City.—This invention consists in securing the parts of the coupling to each other by sliding blocks, and in operating said blocks by means of eccentric grooves formed in a movable part of the coupling.

ARCH BARS AND DOUBLE ANDIRONS FOR EVAPORATING CANE JUICE, ETC.—Gaius S. Deane, Grand Rapids, Mich.—This invention has for its object to furnish improved bars and andirons designed especially for farmers' use in supporting their evaporating pans and fire wood in arches built by them in the sugar bush for manufacturing sugar, but which are equally useful in other situations.

CARRIAGE CLIPS.—Edwin Meeker, Bridgeport, Conn.—This invention relates to certain improvements in the manufacture of carriage and coach clips, and consists in forming the same by means of dies, while they were heretofore made by hand.

FINE-TOOTH COMBS.—James H. Briggs, Brooklyn, N. Y.—The object of this invention is to so arrange a metal strip or band on fine-tooth combs, that the said combs may thereby be strengthened, or that two half combs may thereby be united to make one.

COMPOSITION FOR ROOFING.—Andrew P. Jackson and Otis Pratt, Warsaw, Ind.—The main feature in this invention is the use of a mineral found in great quantities near Dayton, Ohio, in combination with tar, sulphur, plumbago, and litharge, as a roofing material.

PROPELLER AND CURRENT WHEEL.—A. B. Smith, Yankton, Dakota.—This invention is a device which can be used as an endless chain propeller for steamboats, or as a water wheel to be rotated by a running stream for the purpose of furnishing motive power to drive machinery.

LOCK FOR FIRE-ARMS.—Wm. F. Kussmaul, Baltimore, Md.—In this invention a spring stop is provided, which catches under a shoulder of the hammer and holds it up from the cap when the gun is not in use. When the gun is cocked the spring stop automatically retires and leaves the hammer to descend upon the cap.

COMBINED COTTON PRESS AND FEEDER.—Henry Zellner, Columbia, Tenn.—In this invention the ginned cotton is fed to the machine through a shute in which it is cleaned from dust. It is then forced into the press under the

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follower, which presses it to the bottom of the tube, where it is held down by a novel device while the follower returns for a second tube full. This process is repeated till the bale is completed.

SAUSAGES,—Jacob L. Chevalier, Newark, N. J.—This invention consists in combining fish, either fresh or salted, with pork or lard, and with or without potatoes, for preparing the article of food known as sausages.

LADY'S TATTING SHUTTLE.—Silas Schofield, Plainville, Mass.—This invention consists in attaching the shuttle to a holder and providing for winding the thread on the shuttle by a key or crank, thereby greatly facilitating the operation.

WIND MILL.—E. W. Mills, Syracuse, N. Y.—This invention relates to a new and improved method of controlling and regulating the power of the wind and to its application to a pump or other purposes.

ARTIFICIAL LEG.—Henry L. Mills, St. Paul, Minn.—This invention relates to an improved method of constructing an artificial leg, and consists in several devices and arrangements for securing comfort and convenience to the wearer and making a strong, cheap, and durable artificial limb.

TRANSPLANTER.—C. R. Disbrow, Bath, N. Y. Patented Oct. 8, 1867.—This invention relates to a new and improved mode of constructing an implement for the use of gardeners in transplanting plants and shrubs, to remove them with the soil in which they grow without disturbing the roots.

SCISSORS.—J. A. Althouse, New Harmony, Ind. Patented Oct. 8, 1867.—The design of this invention is to combine a buttonhole cutter with an ordinary pair of scissors, for the sake of convenience and economy.

APPARATUS EMPLOYED IN THE PREPARATION OF COTTON AND OTHER FIBROUS MATERIAL.—Wm. Hamer, Little Lever, England. Patented Oct. 8, 1867,—This invention relates to the removal of the sliver from the case or coiler, and consists in placing underneath the material a spring of metal, so that as the sliver is removed from the top of the can or coiler its lower portion is raised upward by the spring, and thereby prevents breakage.

APPARATUS FOR OILING PROPELLER CRANKS.—Jesse Davis, New York City. Patented Oct. 8, 1867.—This invention is designed to obviate the difficulty of oiling journals of propeller cranks and other inaccessible parts of machinery, and provides the means of lubricating them with regularity and certainty and no waste of oil.

LOOM.—H. D. Hunt, Danville, Ill. Patented Oct. 8, 1867.—This invention relates to an improvement in hand looms, and consists in connecting movable plates and levers attached to the lay with the breast beam and the shuttle devices, in such manner that the movement of the lay shall operate on the devices to throw the shuttle and other devices connected with the take up the cloth beam and the working of the treadles and yarn beam.

CULTIVATOR COUPLING.—Joshua Pierpont, La Harpe, Ill. Patented Oct. 8, 1867.—This invention relates to an improvement in the axle and coupling of cultivators, and consists in casting the arms of the axle with a longitudinal groove on the upper side of each, for receiving the ends of a wrought iron connecting bar and a box or boxes on the under side, for receiving a turntable clevis.

BUCKLE.—A. H. Hopkins, Goshen, Ind. Patented Oct. 8. 1867.—This invention relates to an improved plan of construction in metal buckles for harness leathers, or straps of any kind, and consists in forming a rectangular buckle with two tongues, one at each end, hung upon a center bar on opposite sides, in opposite directions, and each tongue provided with a tuck loop for the end of the strap.

HAY FORK.—B. F. Stewart, Cadiz, Ohio.—This invention relates to an improvement in the construction of hay forks, and consists in attaching two curved tines or prongs to a handle by a pivot, on one of which prongs is pivoted a link that is connected with the other prong by a wrist working in a slot, the parts being so arranged and operated that when the prongs are closed they can be pushed into the hay, opening as they penetrate into it, until they are fully expanded to take up a load, which, upon being lifted by the handle and deposited in place in the usual way, is released from the fork by drawing with a hand rope upon the link that connects the prongs in order to close them again.

DEVICE FOR CAPPING SCREW.—Orrin W. Swift, New Haven, Conn.—This invention relates to a new and improved device for capping screws, that is to say, covering the heads of the screws with a white metal cap, and closing the edge of the same all around underneath the edge of the head, and at the same time pressing the portion of the cap over the nick in the screw head directly into the nick without cutting away the cap over the nick as is now done.

OIL CAN.—Charles Williams, Vineland, N. J.—This invention relates to a new and improved oil can of that class which are used for oiling machinery, and are generally made small or portable. The invention consists in the application of an elastic tube to the interior of the nozzle of the can, the tube being loaded with a weight at its free or disengaged end, whereby all of the oil within the can may be expelled from it, and the oil prevented from leaking out of the nozzle in case the can be casually upset.

HUB AND AXLE FOR VEHICLES.—D. M. Buckhart, Mount Kisco, N. Y.—This invention relates to a new and improved metallic hub and axle for vehicles, and it consists in a novel construction of the hub whereby the spokes may be firmly secured in it, the hub allowed to turn on its axle with but little practice, and the whole rendered capable of being adjusted at a greater or less distance apart, as may be desired, and other advantages obtained.

CART SADDLE.—John Bea, Newark, N. J.—This invention relates to a new and useful improvement in saddles, which are used with cart harnesses, and by which the horse is made to sustain a portion of the load of the cart. The invention consists in a novel manner of constructing the saddle, whereby the same may be manufactured at a much less cost than hitherto, and equally as good a saddle obtained.

TIE FOR BALE HOOP.—J. L. Sheppard, Charleston, S. C.—This invention relates to a new and improved tie or lock for connecting together the ends of bale hooks, after the bale has been properly compressed. The object of the invention is to obtain a tie or lock for the purpose specified, which will admit of the ends of the hoop being readily connected together, and which will also admit of bales being repressed without detaching the hoops from the bale, or the tie or lock from the ends of the hoops.

GRAIN-DISCHARGING DEVICE FOR REAPERS.—K. H. C. Preston, Manlius, N. Y.—This invention consists of a revolving toothed head or shaft applied to the platform of a reaper in such a manner that it will receive the grain as it is cut, and when a sufficient quantity of grain has been deposited upon it, be capable, by a semi-revolution, of discharging the grain from the platform without the liability of becoming choked or clogged, and without tangling the grain.

PANEL TABLE.—J. G. Greene, Port Henry, N. Y.—This invention has for its object to so construct the panel ends of sewing machine cases, and other articles of furniture, or the paneling at the side of a room, or beneath a window, that it may be drawn out and form a table.

GOPHER TRAP.—John Curtis, St. Charles, Min.—This invention has for its object to furnish an improved trap for catching gophers, which shall be simple in construction and effective in operation.

TERRASPHERE.—Eleazer Root, Indianapolis, Ind.—This invention relates to improvements in the terrasphere, for which letters patent were granted on the 18th day of December, 1866.

HAY RAKING AND LOADING DEVICE.—Hosea Willard, Vergennes, Vt.—This invention relates to a certain new and useful improvement on a machine for raking and loading hay, for which letters were granted, bearing date August 1st, 1866. The invention consists. 1st, in an improved means for discharging the elevated hay from the upper part of the endless elevator, whereby the hay is discharged at the point specified, in a perfect manner. The invention consists, 2d, in an improved application of the endless elevator to the machine, whereby the teeth of the elevator are allowed to yield or give perfectly to obstructions which may be in their path, or yield to inequalities of the surface of the ground. The invention consists, 3d, in the application of wing rakes to the machine, and endless feeders or conveyors connected therewith, whereby the machine is made to operate over a comparatively wide area, and rendered available for raking up and loading hay as left on the field by the mowing machine.

WAGON BRAKE.—L. E. Woodard, Owasso, Mich.—This invention relates to an improvement in the construction of brakes for wagons, and other vehicles, and consists in attaching a brake bar to the reach to act upon the wheels by means of an eccentric headed lever or cam, in such manner that the brakes may be quickly and powerfully applied, and instantly disengaged from the wheels to relieve them from pressure by a slight movement of the eccentric lever.

SMOKE STACK.—Patrick Kelly, Nashville, Tenn.—This invention consists in placing within the chimney or smoke stack certain arrestors, deflectors, and conductors, which not only prevent the escape of the sparks from the chimney, but collect and discharge them.

DUMB WAITER.—T. B. Bryson, Newcastle, Pa.—The nature of this invention consists in constructing a portable dumb waiter, easily fitted in a dwelling house for opening up through the floor of an upper room, over another room or cellar, without requiring a closet to inclose it, or occupying space in the upper room permanently.

MOLE TRAP.—John Westcott, Patchogue, N. Y.—This invention relates to an improved mole trap, and consists in a pair of forks pressed together by a spring. These are kept apart by a metal dog, the trap set lengthwise, in the channel made by the mole in the ground.

EXPANSION DRILL.—Gilbert Mackinnon, Portsmouth, N. H.—This invention consists in attaching expansible cutters to a suitable cutter holder and expanding the same by a wedge and screw arranged so that by turning the nut on the screw the size of the tool can be varied.

BALING PRESS.—Geo. H. Hoke and John A. Brown, Elizabeth, Pa.—This invention relates to an improved baling press, for hay, cotton, or other substances, and consists in improvements in construction by an arrangement of a lever and toggle connected with a beater or follower operated directly by means of ropes and capstan, with horse-power.

MATHEMATICAL INSTRUMENT.—William Rutherford, Athens, Ga.—This invention relates to an improved mathematical instrument for the use of civil engineers, surveyors, navigators, architects, and draftsmen generally, in plotting a survey from field notes, the traverse or rhumb line of sailing vessels, laying down plans of buildings, etc., with great facility and accuracy.

TOY ENGINE.—James L. Warner, New York city.—This invention consists in the application of a glass boiler, which is provided at the top with one or more tubular iron jointed arms. The said boiler is suspended from a wire or other rope, in which a swivel is arranged, to allow the boiler to revolve: the boiler is filled with liquid, of any desired description, and is suspended above a lamp so that steam is generated in it. The steam escaping through the the curved tubular arm, rotates the boiler by reaction.

ELEVATOR.—Joshua Walker, Kansas City, Mo.—This invention relates to a new and improved device for elevating articles, and is more especially designed for loading the tenders of locomotives with wood or coal, although it is applicable to other purposes. The object of the invention is to economize in labor and facilitate the loading of boats, locomotive tenders, etc., etc.

SASH FRAME.—J. E. Cowdery, Wheatland, Iowa.—This invention relates to an improvement in sash frames, and consists in an L or tongue-shaped lip attached by its long arm to the meeting rail of each sash, so that the tongue of each will enter the groove of the other when the window is closed.

MINERAL PAINT.—J. R. Smith, Keyport, N. J.—The object of this invention is to make a composition which, when used as a paint, shall form a water and fire-proof paint.

CARRIAGE WHEELS.—Reuben Brooks, Rockport, Mass.—This invention relates to a new and impreved method of joining the felleys of carriage wheels whereby the wheel is rendered much more durable than it is when the felleys are joined in the ordinary way, and it consists in providing a metallic clamp for the support of the joint at the end of the spoke.

STOVE.—C. H. Roberts, Troy, N. Y.—This invention consists in applying wood to the knobs of stove doors, whereby the doors may be handled without danger of burning the fingers.

SEEDING MACHINE.—B. A. Shearer, Crown Point Center, N. Y.—This invention relates to a new and improved machine for sewing seed broadcast, and it consists of a revolving grooved cylinder arranged or applied in a novel way and using in connection with the same a series of harrow or covering teeth, all being applied to a frame mounted on wheels and provided with a seed hopper.

KEYS FOR BOLTS.—Nathan Adams, Altoona, Pa.—This invention relates to a machine for making split or spring keys for securing bolts, and it consists in the use of dies and levers whereby the bar from which the key is to be made is cut, bent into the required shape, and then dropped, the whole operation requiring but two moves of a lever, the whole machine being very small and compact.

ADJUSTABLE ROLLER FRAME FOR ELEVATOR PLATFORM.—R. M. Van Sickler, New York.—This invention has for its object to furnish an improved attachment to an improved elevator, patented by the same inventor Feb. 12, 1867, so as to make it more convenient and efficient in use, and which may at the same time be used with other elevator platforms with equal facility and advantage.

JAWS FOR BENCH VISES, ETC.—Nathaniel Wilton, Groton, N. H.—This invention has for its object to improve the construction of the jaws of lathe dogs, bench vises, etc., so that they may be able to hold the work firmly whether it be straight or tapering.

HAY RAKER AND LOADER.—Archibald Campbell, Peoria, Ill.—This invention has for its object to furnish an improved machine for attachment to hay wagons by means of which the hay may be raked and elevated upon the wagon rapidly, conveniently, and without requiring extra help.

GRAIN AND MEAL DRYER.—John R. Evertson, Mount Vernon, Ind.—This invention has for its object to improve the construction of the improved grain dryer patented by the same inventor Nov. 27, 1866, and numbered 59,989, so as to make it more effective in operation, and so that the same effect may be produced with a smaller amount of fuel.

HORSE-POWER.—Zacharias Tobias, Covington, Ohio.—This invention has for its object to furnish an improved horse-power, so constructed and arranged that the labor of loading the horse-power upon and unloading it from a wagon every time it is transported from one place to another may not be necessary.

Answers to Correspondents.

CORRESPONDENTS who expect to receive answers to their letters must, in all cases, sign their names. We have a right to know those who seek information from us; besides, as sometimes happens, we may prefer to address the correspondent by mail.

SPECIAL NOTE.—This column is designed for the general interest and instruction of our readers, not for gratuitous replies to questions of a purely business or personal nature. We will publish such inquiries, however, when paid for as advertisemets at 50 cents a line, under the head of "Business and Personal."

☞ *All reference to back numbers should be by volume and page.*

P. W. S., of Mass.—The so-called granite of Quincy, Mass., is really sienite, and as a building material is preferable to real granite, the mica in the latter tending to contribute to its disintegration. Sienite—that quarried at Quincy—is composed of felspar, quartz, and hornblende.

G. D. G., of N. Y., says: "A friend of mine is trying to make a marketable hard soap from the following recipe: 5 bars B. T. Babbitt's German Erasive Soap; 5 quarts of water; three ounces of borax, and 1 ounce spirits of ammonia. But his product is too soft and shrinks badly. He asks how it can be made harder and less shrinkable." We reply: use one quart instead of five quarts of water to get a harder product, and keep the soap in a damp cellar to prevent shrinking. But the proposed improvement on the original Babbitt soap will not pay for the trouble. The recipe is probably a catchpenny imposition.

A. G., of Fla., says: "I see in your issue of Oct. 5th, page 216, that J. H. S., of Ohio, asks how he can harden steel plows without springing. This is my recipe: Chalk the share thoroughly, then heat it a cherry red and lower it slowly into a tank or barrel of rain water—in an upright position—and it will not spring."

C. D., of Mass., asks us to tell him how to find the horse-power of a steam engine. We have replied to this question at least six times in as many months through this column. If C. D. will examine back numbers of this paper—which we have not time to do—or read Bourne's Hand Book of the Steam Engine he will procure the knowledge for himself, and it will be all the more valuable to him for the labor expended.

J. D. P., of Pa.—The tin foil used in putting up tobacco is now made of lead and tin. The exact process we do not understand, but believe it is similar to the manufacture of gold wire, a bar of lead being coated with tin and then rolled to the requisite tenuity.

C. H., of Conn.—The note you refer to concerning the employment of a cane held above the head as a protector from rain in lieu of an umbrella, if published in these columns, was probably noticed as a popular humbug. We are not aware of such an invention, and cannot accept the explanation you propose.

A. M. A., of N. Y.—Enamel colors used by jewellers are metallic oxides incorporated with a fusible flux such as borax, flint, oxide of lead, etc. The jeweller labors under considerable difficulty during the process of application, for the tints on the palette in most cases differ from those they assume after being heated sufficiently to cause the color to become fixed to the ware. If "over fired" or "short fired" the color is destroyed beyond remedy in one case, or assumes one of the intermediate variety of shades, in the other; the definite heat which alone gives the color a perfect hue, is only recognized after long practice.

J. B., of O., is referred to the corresponding column on page 87, current volume, for cements for water joints.

A. J., of Md.—Needles made of steel, and called at first Spanish needles, were introduced in the reign of Queen Elizabeth, but by whom invented, history fails to tell. Pins, such as we now use, seem to have been unknown in England until about the middle of the fifteenth century. Previously, substitutes were employed made of box wood, ivory, bone, and a few of silver, all being necessarily of such large size that brooches and hooks and eyes were much employed in preference for holding together the parts of the dress.

L. F. S., of N. Y.—The latest explanation for the autumnal change of leaves with which we are acquainted is that of M. Carey Lea, of Philadelphia. He considers light to be the primary cause, the tendency always being to produce photographic colors. While the leaf retains its full vitality this influence is successfully resisted, but in autumn the leaf gradually loses its hold upon the branch, and the action of light predominates producing the change. These views we previously published on page 181, Vol. XV.

P. D., Canada.—Hollow water grate bars are very old.

C. R. W., of Pa., asks for a thermometer to ascertain the temperature of molten iron. Above the boiling point of mercury heat is measured by its effect upon solids. Wedgewood's pyrometer is the oldest instrument of this kind, and is founded upon the contraction of clay at high temperatures. Daneill's pyrometer is more exact, depending upon the expansion of a platinum bar encased in a sheath of black lead. A line under our "Business and Personal" column would bring you the address of manufacturers of these instruments which we are unable to furnish.

S. G., of N. Y., asks what is the greatest number of times that any piece to be brought to the shoulder can be fired in a minute, how it is constructed, what kind of a charge is used, and if it has more than one trigger. We refer our correspondent to the Ordnance Board of the War Department. We have seen a Sharp's rifle brought to the shoulder and fired twenty-one times in a minute. Its construction must be familiar to all interested in these matters. Other pieces, we are informed, excel this in rapidity.

P. C., of Me.—Your article on the combustion of fuel is anticipated by a similar one in this issue of the SCIENTIFIC AMERICAN. Your facts have been so often reiterated that it hardly seems necessary now to reproduce them. We reserve the article for possible future use.

W. C., of Ohio informs us that he has sent a communication on boiler setting which has not been published and asks what he shall do to obtain a hearing. In reply we would say that we wish for *facts* not surmises, and want them boiled down to their essence. "This rule," as the military men say, "is general."

T. I., of England, proposes, for a light water power, building a tank in which is an upright pipe, bent as a syphon, the longer limb descending outside, below the reservoir, with some means of exhaust to induce the flow of water which will be discharged on a wheel. But he wishes to return the water back and asks how it is to be done. He inquires also how he can obtain some of the ingenious American tools he sees noticed in the SCIENTIFIC AMERICAN and refers to an improved gimlet and a back saw, as examples. If he will refer to No. 17, current Vol., he will find the leading editorial contains some information on his first inquiry, and in our issue of July 13th, page 23, and that of July 20th, page 37, he will understand about the back saw and gimlet. Any responsible dealer in tools and machinery can furnish him with American improved tools. Probably advertisers in the SCIENTIFIC AMERICAN will notice this call from across the water.

H. H., of Wis., sends us a carefully prepared paper on mechanical power which we have read and the statements of which we have considered. If they are valuable they are too verbose, and as they controvert the experience of years and the observations of scientists we decline to publish them in the form presented. Our correspondent sneers at science as having "for ages believed in false theories." Let him present the opposing facts and we will welcome them.

Business and Personal.

The charge for insertion under this head is 50 cents a line.

Inventors and Manufacturers of Labor-saving Machinery, Articles useful in the Household, the Workshop, or on the Farm, will find it to their interest to send circulars to, or correspond with, "The Texas Labor-Saving Machinery Agency," P. O. Box 244, Houston, Texas.

Mr. N. E. Blake, who obtained a Patent for a Roofing Composition, will please address R. C. Graves, Barnesville, Ohio.

Sewing-Machine Cabinet-Case Manufacturers or Patentees, and Manufacturers of Sewing-Machine Oilers please publish your address in this paper.

Wanted—Address of Manufacturers of Bullets and Cartridges, C. H. Remington, Dubuque, Iowa.

A Young Man, who has completed the Scientific Course in the Cooper Institute and received the Medal and Diploma of the same, desires a situation as assistant to a Civil Engineer or Surveyor. Best of references given. Address A. Doerflinger, 489 Columbia st., Brooklyn, N. Y.

Shingle-Sawing Machine and Portable Grist Mill Wanted.—Send descriptive circulars, with cuts and prices, Thos. Hoge, Milo, Wetzel county, W. Va.

EXTENSION NOTICE.

Charles R. Harvey, of New York city, having petitioned for the extension of a patent granted to him the 24th day of January, 1854, for an improvement in air-heating furnaces, for seven years from the expiration of said patent, which takes place on the 24th day of January, 1868, it is ordered that the said petition be heard at the Patent Office on Monday, the 6th day of January next.

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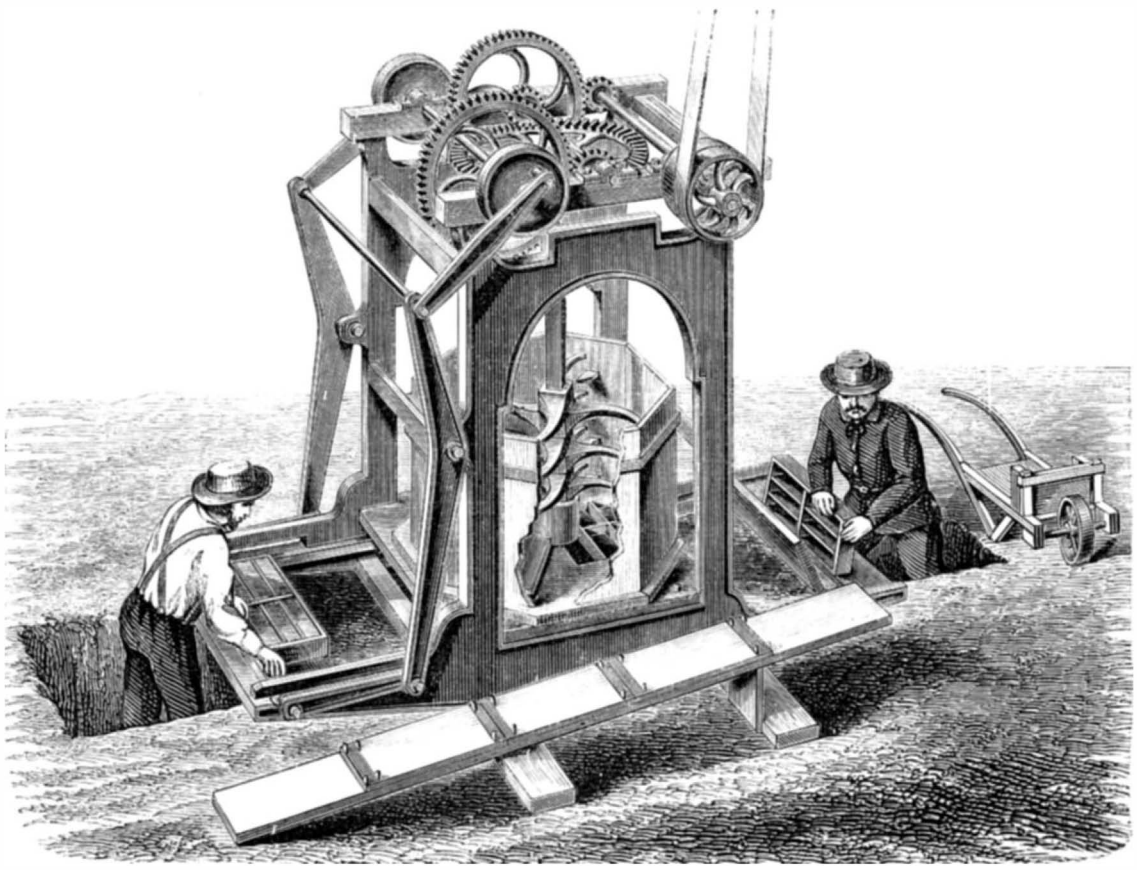
Improved Brick Molding Machine.

The simplicity of the machine represented in the engraving renders any detailed description unnecessary. The inventor says in brief: "The nature of my invention consists first, in the flat, square, or triangular bar for pulverizing the clay; then the mode of stepping the shaft within the clay box, that is to say the projecting hub on the bed plate with its wooden conical seat in combination with the cavity in the stem of the screw, by means of which the surrounding clay is excluded from the step to prevent the wear, and the screw is brought down near the bed plate to wipe as closely as possible without contact. Thus the throat of the screw gathers within itself a charge of clay which cannot escape except through the openings of the bed plates into the molds beneath. The open portable mold frame with a projecting flange, the mold resting on a single detached plate for a bottom, so that when the mold is thrown on the floor the brick does not come at the same time in contact with the ground because the flanges prevent this result; but the concussion is just sufficient to start the brick when it slips easily from the mold."

The cavity in the center of the screw or sweeping blade incloses the step of the shaft and allows the blade to come clear to the bottom of the mill. The molds are carried from the mill by the rocking bars seen in the engraving driven by the cranks at the top of the machine. It will be noticed that the grinding machinery is geared down so that the expenditure of power will be much less than in some less heavily geared machines. The clay is taken direct from the bank and passed through a pulverizer which reduces it to dust and frees it from stones and other foreign matters. Water it then thrown upon it and it remains in soak all night. This part of the operation is of great importance at the South, as it has all the effect of winter digging. By steam or water power this machine is claimed to produce three thousand bricks per hour, while the labor of one horse will yield eight hundred.

It is the subject of two patents granted to Francis H. Smith, who may be addressed relative thereto, Box 556, Baltimore, Md.



SMITH'S BRICK MOLDING MACHINE.

Science Familiarly Illustrated.

The Gordius or Hair Worm.

Every one who has lived in the vicinity of ponds or streams, must often have seen in the water a worm or snake resembling in appearance a coarse human hair. To the unaided eye the resemblance is perfect, with the exception of motion. It is a common notion that these worms were originally hairs, and that the transformation has been effected in some mysterious way by the action of the water. When a boy, we have frequently dipped them up in buckets, and watched their motions for hours. They are from seven to thirty inches long, and are frequently found in the bodies of beetles, and in moist earth, as well as in the water. Sometimes they are found floating, snarled into a knot or curl, and enveloping a little white mass. This mass contains its eggs, which are agglutinated together, and number millions. When seen on the surface of the earth in dry weather, they are brittle, and if handled will break like a dry twig. A rain, however, or heavy dew, will restore their suppleness. A writer in one of our exchanges thus details his observations made on one of these worms:

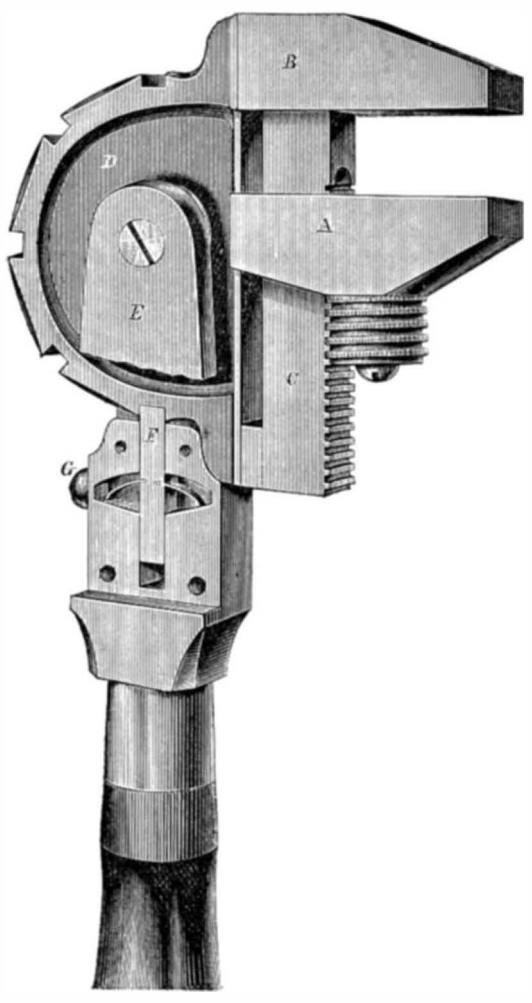
"When I first received it, it was coiled up in a close roll at the bottom of the bottle, filled with fresh water that contained it, and looked more like a little tangle of black sewing-silk than anything else. Wishing to unwind it, that I might examine its entire length, I placed it in a large china basin filled with water, and proceeded very gently to disentangle its coils, when I perceived that the animal had twisted itself around a bundle of its eggs, holding them fast in a close embrace. In the process of unwinding, the eggs dropped away and floated to a little distance.

"Having finally stretched it out to its full length, perhaps half a yard, I sat watching to see if this singular being, that looked like a long black thread in the water, would give any signs of life. Almost immediately it moved toward the bundle of eggs, and, having reached it, began to sew itself through and through the little white mass, passing one end of its body through it, and then returning to make another stitch, as it were, till the eggs were at last completely entangled again in an intricate net-work of coils. It seemed to me almost impossible that this care of offspring could be the result of any instinct of affection in a creature of so low an organization, and I again separated it from the eggs and placed them at a great distance, when the same action was repeated.

"On trying the experiment a third time, the bundle of eggs had become loosened, and a few of them dropped off singly into the water. The efforts which the animal then made to recover the missing ones, winding itself round and round them, but failing to bring them into the fold with the rest, because they were too small, and evaded all efforts to secure them, when once parted from the first little compact mass, convinced me that there was a definite purpose in his attempts, and that even a being so low in the scale of animal existence has some dim consciousness of a relation to its offspring. I afterward unwound also the mass of eggs, which, when coiled up as I first saw it, made a roll of white substance about the size of a coffee-bean, and found that it consisted of a string of eggs, measuring more than twelve feet in length, the eggs being held by a gelatinous substance that cemented them and prevented them from falling apart. Cutting this string across, and placing a small section under the microscope, I counted on one surface of such a cut from seventy to seventy-five eggs; and estimating the entire number of eggs according to the number contained on such a surface, I found that there were not less than eight million of eggs in the whole string."

WHITE'S IMPROVED MONKEY WRENCH.

The ordinary monkey or screw wrench is one of the most useful tools in the machine shop, factory, mill, stable, or on the farm. It can be so readily adapted to all sizes of nuts, and to hexagonal as well as square heads and nuts, that no other single implement will subserve so many useful purposes. The ratchet wrench is slow of action and is not capable of so many adaptations; and it would be desirable if the screw wrench could be made to serve the purpose of the crooked or S-wrench and some other forms designed for special occasions. Such is the object of this improvement.



The jaws of the wrench are arranged in a similar manner to those on the common screw wrench, the movable jaw, A, being advanced to or receded from the fixed jaw, B, by a nut which engages with the segmental thread cut on the shank, C. This shank is firmly secured to a semi-circular disk, D, which turns on a pivot or screw passing through the arms, E, by which means the jaws may be rotated around half a circle. The periphery of this disk has a number of notches into which fits a spring pawl, F, which is receded from contact with them by a knob, G, to be operated by the thumb or finger. In the engraving a portion of one of the arms is broken away to show the pawl. From this description the action of the wrench can be easily understood. The jaws may be secured in any position between the two opposite points of a half circle so as to be adapted to the situation of the nut to be turned. Thus the wrench may be used as an ordinary screw wrench, a hook wrench, a straight wrench, or a curved wrench, while the jaws may be set to accommodate any size of nut. Machinists and others who require wrenches will see the advantages of this device.

Patented August 1, 1865 by James White, Cleveland, Ohio. The patent is for sale. Application should be made, personally or by letter to J. H. Beardsley, 119 Nassau street, New York city, or to the inventor, Cleveland, Ohio.

Novel Application of Electro-Magnetism.

The last number of the *Cosmos* contains an article of considerable interest of the various applications of electro-magnetism by Prof. Glæsener, of the University of Liége, in Belgium. Among them there is a Chronograph for the measurement of very minute particles of time, and which deserves some description as regards its application to artillery. Suppose it be required to measure the velocity of a cannon ball. For this purpose let a series of targets, consisting of hoops intersected by wires, be placed at given distances. The wires of each hoop communicate with a separate electro-magnetic apparatus, by which an iron pencil-holder is kept in an unvarying position by attraction so long as the circuit is not interrupted. Opposite and close to this pencil-holder there is a cylinder turning on its axis at the rate of four revolutions in a second. Its surface, which is covered with paper, is divided into 500 parts by lines drawn parallel to its axis, so that each part represents one two-thousandth of a second. Its motion is effected by clockwork. Now, whenever the electric current is interrupted the pencil-holder ceases to be attracted and falls on the surface of the cylinder, on which its pencil, therefore, describes a line. Whenever the circuit is completed the pencil-holder is re-attracted and leaves the paper. Let us now suppose a cannon ball to be fired through all these targets, so placed, of course, as to lie in the path of the curve described by the missile. Each time it passes through one of the hoops it snaps asunder one of the wires: the circuit is consequently interrupted, the pencil-holder falls and marks the precise time of the passage. And so on, from target to target, each of which, as we have said, is connected with a separate apparatus. In this way both the space and the time employed in going over it being determined, the velocity, which is the ratio of time to space, is determined also to a fraction of one two-thousandth of a second.

The Brazilian Pebble--Natural Glass.

J. W., R. B., and A. G. A., of Ill., have a dispute they wish us to settle. It is whether "the so-called pebble spectacles are stone, or a superior glass made from a peculiar stone. Are there stones large and clear enough to be ground to make spectacle lens?" We do not care to act as arbiters in disputes, but will furnish the information desired. The lenses are made from a rock or quartz crystal, which may be considered a natural glass. The Brazilian pebble is highly esteemed because it is harder than glass and not so liable to be scratched. It has a lower dispersive power than other pebbles and than many glass lenses. A splendid specimen, spherical and perhaps three inches diameter, is to be seen in a jewelry store in Brooklyn.

Pickwickian Antiquarians.—An exchange asserts that the Minnesota Historical Society, in their late excursion to Lake Minnetonka, to investigate the remains of the "ancient mound builders"—a race dwelling in this country long before the arrival of the Indians—were successful in finding several human bones, which after a labored discussion proved to be the broken limbs of trees. A supposed skull elicited great attention from its remarkable phrenological development, but a rustic demonstrated to the learned gentlemen that the supposed cranium was in truth a mud-turtle's shell. Several mounds, it is stated, have been prepared and supplied with bones and pieces of broken crockery, for the future investigation of this society.

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NEW YORK, SATURDAY, NOVEMBER 2, 1867.

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MALLEABLE QUALITIES OF LEAD.

Probably scarcely any other metal, not excepting even gold, presents more interesting qualities for investigation than lead. One of those qualities is its malleability, and its quality of being compressed upon itself, the latter a quality for which we have no definite term. If a leaden ball lodges in the bore of a smooth bore or rifle it is almost impossible to start it. We have seen a Colt's pistol, with barrel only six inches long, which had, lodged in it and imbedded one into the other no less than fourteen conical bullets. The one which first lodged was probably propelled by an insufficient charge of powder, not enough to send it out of the muzzle, and the successive charges were not powerful enough to move it. On the fourteenth round the barrel opened longitudinally. Another case occurred in which the bullet of a rifle lodged about midway of the barrel and the rammer was tried repeatedly to remove it without effect. At last a hardened steel rod was driven completely through it, cutting a plug out of its center, and leaving a ring of lead which had to be drilled and reamed out. In a small town in Massachusetts a large rock disfigured the village green, which had been drilled for blasting and a blast repeatedly fired to split it, without success. At length it got to be used as the town gun for firing salutes. A shrewd, thinking mechanic conceived the idea of tamping a charge with lead. He did so and split the obstinate rock into removable pieces.

A large public building was, some years ago, in process of erection in Boston. It was built of granite blocks and the outer seams of the lower courses were closed with lead tamped in with a set and hammer. This work was intrusted to an inexperienced apprentice, who continued to force the lead in until he cracked the stone immediately above the seam and opened the vertical seam in the next course. As the building was between forty and fifty feet high the lead must have raised many tuns weight by the simple force of a hand hammer.

In the same city a large ornamental iron fence was erected around a square. The hollow iron posts rested on granite blocks set in the earth, having a cross section of fourteen or fifteen inches. The iron posts were secured to the stone by means of iron rods one and a quarter inches diameter. These were upset and broadened at the lower end and dropped into a hole in the stone about four inches deep, the hole being largest at the bottom. Lead was poured into the hole around the iron bar, the post lowered to place and secured by a nut on the upper end of the bar. Several of these stones were split in setting-up the nut and the lead was found to be nearly as hard and compact as the iron. In this case it could not have been the heat of the melted lead that split the stone, for it would not have been sufficient to produce such a result.

It would seem that this quality in lead might make it useful in quarrying stone. In the city of New York there is a large bed of very fine granite, extending from Thirty-first street on the west side and from Twenty-fourth street in the middle, to Sixtieth street on the north. The material of the Croton Aqueduct was mostly taken from Tenth Avenue near Forty-eighth street. Owing to the contiguity of dwellings and other buildings, blasting, except to a very limited extent, would be dangerous. The usual method of separating the blocks is by inserting wedges of iron cased with sheet iron into quadrangular holes drilled in line a few inches apart which are then driven, gradually and simultaneously, until the mass is separated. The adhesiveness of lead would appear to give it an advantage in this case over the sheet iron

Lead has also the quality of expanding after being closely compressed, or of regaining, in some degree, its original porosity. For this reason pressed leaden bullets are not in favor, because, in time, they expand or swell beyond the limits of the mold or matrix in which they were pressed, and become too large for the caliber of the bore for which they were intended.

THE RELATIVE ECONOMY OF ANTHRACITE AND BITUMINOUS COAL IN STEAM BOILERS.

Theoretically considered, the more volatile combustible (*i.e.* hydrogen) there is in a coal, the greater will be the quantity of water evaporated per pound consumed; for the reason that the heating power of a fuel is measured relatively by the quantity of oxygen that will enter into combination with its combustible constituents.

Hence a pound of hydrogen, as it combines with three times more oxygen than a pound of carbon, has three times more calorific power; and consequently a coal which contains hydrogen, must be a better steam generator than one which does not, such as anthracite.

It is of course assumed that the furnace is of proper construction to produce perfect (or nearly so) combustion. To insure perfect combustion it is necessary to supply and mix the combustible gases driven from the fuel by the heat of the fire, with a sufficient quantity of air to furnish the necessary weight of oxygen to saturate them; and also that in that portion of the furnace where this mingling of the air with the gases takes place, a sufficiently high temperature is maintained to cause them to combine with the oxygen. If these conditions are not fulfilled, it is almost unnecessay to add that the furnace, instead of being a chamber where the fuel is thoroughly burned, is turned into a gas retort, and an immense proportion of the combustible matter passes up the chimney, and is wasted.

The construction of boiler furnaces, to fulfill the chemical requirements we have mentioned as necessary to thoroughly burn the fuel, and to prevent smoke, if it contains hydrogen, is now so well understood, that it is disgraceful for those using bituminous coal for steam purposes to obscure the landscape with black smoke. In our opinion the prevention of smoke is a proper subject for legislative interference, as regards both stationary boilers and locomotive engines. As to railroads, it should be one of the conditions of future charters that their engines shall not belch forth black smoke; and as for those roads already in operation, the law should compel them, by a good round fine, for any engine seen to smoke, to alter them so as to prevent this nuisance.

We will venture to say that most of our readers have been made as black as chimney sweeps by a ride of even less than fifty miles on a railroad on a hot summer's day. This nuisance, for the most part, is endured by the sufferers without rumbling, on the supposition that it cannot be prevented. This, of course, is a popular fallacy; and when one sees a locomotive tearing along, and belching forth volumes of smoke as black as ink, he is pretty safe in concluding that the managers of that road are either too ignorant or too parsimonious to cause the trivial changes to be made which will effectually put an end to this sooty nuisance.

With that species of coal known as "semi-anthracite," it is of course considerably easier to prevent smoke and soot than with bituminous. In fact, furnaces of ordinary construction, fired with a little care, can use coal with thirteen or fourteen per cent. of volatile combustible, with scarcely any smoke at all.

In order to show practically the difference in the evaporative power of anthracite and hydrogenous coal, we will give the following experiments, which were made with a semi-anthracite coal of the following analysis, and anthracite of good quality:

Fixed carbon	79.64	per cent.
Volalatile combustible	13.16	"
Moisture	0.39	"
Sulphur	0.82	"
Ash	5.98	"

Weight of one cubic yard, 2,217 lbs.

The experiment was made in the boiler of a ferry boat, near Boston, doing the same quantity of constant and regular work in both cases—the result was:

	lbs.		hours.
Coal, anthracite, consumed	47,467	in	93
" as per above analysis, consumed.	36,807	"	"

Difference in favor of semi-bituminous 10,660 lbs.; or, in other words, the semi-anthracite, according to this experiment, had some 23 per cent. more evaporative power than the anthracite, or in the ratio of about 5 to 6.

Other experiments of a similar nature, which have fallen under the observation of the writer, appear to confirm the above results.

No doubt the superior cleanliness of anthracite, and the fact that even if its combustion is not perfect, it is not made manifest by black smoke, are strong arguments in its favor, and will continue to maintain the high reputation which it has so long enjoyed for steam generating purposes; but then we know that with proper management, and suitable furnaces, the evaporation of the bituminous is much greater.

THE LARGEST PAIR OF PROPELLER ENGINES IN THE WORLD.

The direct acting engines for the English iron clad *Hercules* built by John Penn and Sons at Greenwich, near London, are the largest pair of screw engines ever constructed.

They are of the double trunk variety, a style built almost exclusively by the Messrs. Penn. There are two cylinders, each 127 inches in diameter, by 4 feet 6 inches length of stroke of piston; the diameter of the trunks is 47 inches, whose area being deducted, gives the pistons an effective diameter of 118 inches.

These engines are intended to run 60 revolutions per minute, consequently the two pistons, pass through a volume of 84,600 cubic feet per minute; they are to be supplied with steam by the ordinary horizontal tubular boilers, containing in the aggregate about 1,000 square feet of grate surface; they will be fitted with superheaters. It would seem therefore that these engines are intended to be worked highly expansively, and notwithstanding the comparitively small boiler capacity, the eminent engineer who constructed these monsters promises for them no less than 7,200 indicated horse power. Judging from the performance of many engines of similar style built by this firm we have no doubt that this enormous power will be realized. A comparison between the engines of the *Hercules* and those of the U. S. S. *Wampanoag* cannot fail to show that the planner of the machinery of one of these ships has made a big mistake.

The *Wampanoag* engines are geared and are expected to make 30 turns per minute, the cylinders are two in number and are 100 inches in diameter by 4 feet stroke of piston Hence the pistons will sweep through a volume of 26,784 cubic feet per minute. So while the *Hercules* has a capacity of cylinder represented by 84,600 cubic feet, the *Wampanoag* has a cylinder capacity represented by only 26,000 cubic feet. In other words, although the eminently successful builder of these big direct acting engines employs over three times more cylinder capacity than Mr. Isherwood does in his "cog wheel" engines, he uses considerably less boiler than that blundering engineer. As a consequence, while the engines of Mr. Isherwood will only work up to some 4,000 indicated horse power, those of Penn will work up to 7,200 indicated horse power. Again the 7,200 horse power engines take up about 8 feet 6 inches, in the length of the ship, less than the 4,000 horse power engines, and their boilers occupy some 20 feet less in the same direction. Thus if the *Hercules* engines were placed in the *Wampanoag*, she would be urged by more than double her present power, and at the same time much less room would be occupied in the vessel by machinery, and, *ceteris paribus*, she would be driven over 18 knots per hour.

It would seem that Penn and other successful builders go ahead just as if the U. S. Navy Steam Blue Books with their "seven tenths cut-off" and non-superheating theories had never been published.

AMERICAN INSTITUTE FAIR.

TOOLS AND MACHINERY.

Horatio Allen of the Novelty Works exhibits a propeller engine of the pendulum variety, although differing in some respects from the ordinary pendulum engine. The cylinder is suspended at its upper end, and projecting across in the line of oscillation is a beam, one end of which carries a connecting rod which drives the feed, and the other end one which drives the air pump. Secured to the lower end of the cylinder is a frame which carries the slides for the cross-head, or rather the sliding box, and oscillates with the cylinder. The crank wrist connects with the sliding box and the combined motions—oscillating, reciprocatory, and revolving—are very smooth. A link motion governs the action of the valves. Although this engine is in the exhibition, driven by a belt and not by steam, it is worthy the notice of engineers, although there are some faults of construction which detract from its merits.

There are several drops and hammers which attract considerable attention. A very simple one is that exhibited by Charles Merrel & Sons, 556 Grand street, New York City. It is Goulding & Cheeney's patent with Water's improvement. The drop or hammer is suspended in a frame by a piece of hard wood planking, which, is clamped when raised between two rollers on horizontal shafts at the top. The drop is raised and released by the ordinary treadle, which either brings the rollers in contact with the surfaces of the plank or disengages them. The advantages claimed for the wooden plank over a leather belt are durability, rigidity, absolute contact, and direct action. This is the drop under which poor McGowan had his hand crushed, and has been illustrated in these columns.

The Grimshaw Compressed-Air Hammer is a rapid working machine, the blow being given by the compressed air in a cylinder. Its operation, under skilfull manipulation, is instantaneous and it is under perfect control. A steam engine drives the machine and compresses the air, the whole apparatus combined in one heavy frame. The cushioning at the end of the stroke can be instantly regulated at will. The air compressor, when not in use to drive the hammer, can be em-employed to give a blast. The machine can be used as a drop, hammer, pass, punching machine, etc, and can be worked by one man.

Sturtevant's Pressure Blower is one of the most efficient rotary blowers we have ever seen. It seems to require much less power in proportion to the blast delivered than the ordinary fan blower owing to peculiarities in its construction. It is difficult to describe it without diagrams, but mechanics witnessing its operation can readily understand the principles of construction and working. These blowers are manufactured in Boston, Mass. Waltons & Leonard, 58 John street, are the sole agents for New York and vicinity.

The New York Steam Engine Company make quite a display of machinists' tools, consisisting of a car-wheel borer, planer, upright drills, shaping machines, bolt cutter etc, the latter a machine that produces a beautiful thread, its capacity ranging from half an inch to two-and-a-half inches diameter. These tools are noticeable for strength and good workmanship rather than for extraneous finish.

Pratt, Whitney & Co., of Hartford, Conn., exhibit one of

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their engine lathes with Slate's patent taper attachment, which was illustrated on page 124 No. 8, Vol. XVI., Scientific American. The lathe at the Fair is sold to the Swedish Government, for which and the Austrian government the firm has done a large amount of work. Being in New York on its way to its destination it was detained for a time for exhibition. Like all their tools, this shows the perfection of finish and accuracy. For boring tapering holes, as well as turning tapers, machinists will acknowledge it to be a valuable tool.

J. A. Fay & Co., of Cincinnati, Ohio, show a fine collection of wood-working machinery. An observable merit in their machinery is its excellent proportions of material, together with good workmanship.

In saws, R. Hoe & Co., and the American Saw Company both of New York city, make fine displays. W. P. Miller, also, of San Francisco, Cal., has a specimen of his adjustable teeth in a large circular saw. Both of these latter have been illustrated in these pages. This department of the exhibition proves that very great attention is now being paid to the perfecting of tools in their details.

The brick machine of D. W. Seeley of Albany, N. Y., illustrated in the Scientific American page 279, No. 18, Vol. XV., is at work turning out bricks from the raw clay brought in barrels, without the straw, the want of which seemed to be the great annoyance to the Israelitish slaves in Egypt. The rapidity of its operation and the perfection of its products are sufficient recommendations of its utility and general advantages.

One of the curiosities in the exhibition is the machine for putting up tobacco in papers—tin foil. Its operation is a marvel until investigated. The parts exposed to view are few and apparently simple, but like the automaton chess player of Maelzel, the machinery that gives them life is concealed in a box. The tobacco being placed in a sort of hopper, a piece of tin foil and a corresponding piece of paper is placed on a platform when, by the turn of the crank, the envelope is folded into shape, the tobacco forced in, and the paper filled ready for sale and delivery. It can be operated either by hand or power.

We regret that the agricultural department in the south gallery is without attendants, and that the machines are not in many cases furnished either with cards containing names of the exhibitors, or circulars giving any description of operation. Among the agricultural machines are several which seem worthy of notice, but not being furnished with the claims of their exhibitors and no space being allowed for their thorough examination, we are obliged to pass this department by without further notice.

Mr. Linnell, who was so cruelly mutilated by falling into the engine he was driving died on the 18th of October. Mr. McGowan, who lost his right hand under the Merrill hammer is doing well. Being a practical mechanic, depending upon his daily work for his daily support, his case is a hard one. Both these men have, or had, dependent families, and it seems as though the Association ought to donate the proceeds of one day's exhibition to their benefit. If the Board of Managers cannot afford that, let the exhibition be extended one day for this purpose, and a notification to that effect would bring out hundreds, who would not otherwise visit the exhibition.

DEPARTMENT OF THE DWELLING.

Before concluding our notice of this section, there are a few articles of merit yet to notice. The remontoir tower clock, manufactured by G. M. Stevens & Co., of Boston, hourly, at least, attracts general public attention. This clock is claimed to be the most reliable and best timekeeper ever introduced. The escapement is a remontoir action and produces an impulse upon the pendulum which is exactly alike during each and every minute. The agents for this city, Benedict Brothers, also exhibit four regulator clocks with compensating pendulums.

In the cutlery department, Clement Hawkes & Maynard have a fine case of ivory and pearl-handle knives. Two cards of pocket knives, artistically arranged, ranging from the most delicate of penknives to the homelier but more serviceable jackknife, and comprehending over three hundred different styles, are samples of the manufactures of D. F. Smith & Co., of Bronxville, N. Y. A bale of brown cordage in an unconspicuous place, is labelled as specimens of rope made from California vegetable hair, but further information relative to this real curiosity, beyond this simple statement, is unfortunately not forthcoming. Near this bale the Union Fence Company have erected one of their combination fences, which, though made of wood, has all the appearance of stone with the strength of iron. The work on these is all done by machinery, the several parts are snugly fitted, and are driven together with lead and oil, while the neatness, strength and asserted cheapness make this one of the best fences in use.

For a simple article of domestic utility, the combined dustpan and broom of Clough & Bryant commends itself to favorable notice. The handle of the pan is made hollow and through it slides the broom handle, thus giving to this badge of the tidy housewife a neat and compact form. Equally convenient is Richmond's rubber rack for holding brooms, brushes, canes and whips. The arrangement consists simply of a disk of india rubber having slits perforated in it, so that the handle is grasped and firmly held in its upright position.

There is an imposing display of glass and silver-plated ware exhibited by house-furnishing establishments of the city, but we have not the further space to devote to this department,

DEPARTMENT OF DRESS AND HANDICRAFT.

Although this is one of the most attractive of the seven grand divisions, under which the managers of the Fair chose to classify the articles offered for exhibition, yet from the nature of the department our report must be somewhat brief and cursory. We might go into ecstacies over the really beautiful specimens of wax flowers and autumnal leaves, which so perfectly mirror nature as to cause a constant succession of rarified superlatives to flow from the lips of enraptured beholders—but we forbear. Space might be filled by an enumeration of the articles of female adornment displayed in attractive show cases, but such description would hardly fall within the scope of these columns; and, for a like reason, although the subject might not prove so incomprehensible, we must omit any elaborate notice of goods of gentlemen's wear. Rolls of cloth are there, woolen, cotton and silk, the comparative merits of which must be discussed by the awarding committee only. Of sewing and knitting machines, we have already noticed the more important.

To the non-professional eye, the imposing array of artificial teeth daintily mounted upon velvet cushions, is somewhat appalling, while the cases of dental instruments are to most observers, too suggestive of past or prospective torture to be attractive. There are about three hundred practicing dentists in this city, and although all are not exhibitors here, the profession does not lack for representatives, most of whom claim for their wares points of superiority, which, however, are not peculiarly striking to the general nor even the repertorial eye. We notice that several exhibitors have adopted an impressive method of proving to the world their claims as benefactors of the race, by conspicuously posting duplicate photographs of the same personage: one with sunken cheek and general antique expression, while the other picture, representing the individual provided with a set of the exhibitor's patent improved dentures, would have been accepted by old Ponce de Leon—unacquainted alike with either dentists or photographers—as conclusive evidence of the existence of his long sought rejuvenating spring.

Though thus unceremoniously dismissing this Department, there are several novelties which are worth referring to. The Bangs Williams' News Company, of Providence, exhibit a large and varied assortment of rich fancy boxes for holding handkerchiefs, gloves and jewels, which, although pronounced by most observers French goods, are made in Providence, and are now brought before the public for the first time. The American Kaleidoscope Company have made a decided improvement on this optical toy, and given it something more of importance than it hitherto possessed. As previously constructed, only transparent objects could be shown in it, but by admitting the light so as to be reflected to the eye, opaque objects, such as flowers, insects, and stones, as well as transparent ones, may be used, and being elegantly constructed, the improved kaleidoscope is destined to become very popular.

There are several exhibitors of bronze goods, among which we may note the small fancy bronzes and carte-de-visite mountings of P. Mignot, and the bronze clocks and gas fixtures of the Tucker Manufacturing Company.

Under the second grouping there is a case of vulcanite cravats and bows, by the New York Hard-rubber Collar Manufacturing Co. These and Merritt's scarf and tie-holders—the latter a neat frame or plate whereon can be formed a scarf or tie, without sewing—are conveniences whose virtues are at once apparent to the masculine mind.

The American Fishhook and Needle Company, of New Haven, have a case of hooks of different sizes made entirely by machinery at the rate of two hundred a minute. This company is the pioneer in this manufacture, hitherto all hooks having been made by long and tedious hand processes.

FINE ARTS.

Prang's chromos are almost, if not quite as natural as water colors or oil paintings. Chromo-lithography is the art of painting pictures from stone in colors. The most difficult branch of it—which is now generally implied when chromos are spoken of—is the art of reproducing oil paintings. When a chromo is made by a competent hand it presents an exact counterpart of the original painting with the delicate gradations of tints and shades, and with much of the spirit and tone of a production of the brush and pallet. The impressions from the stone are taken on thick white paper which passes through a heavy press before being used. Among the most beautiful, to our eyes, were Nos. 8 and 10—scenes from the White Mountains, and late autumn in the same beautiful region—from an oil painting by A. T. Bricher. Prang, of Boston, has carried this art to greater perfection than any other publisher in this country.

Hanging low and almost out of sight, we notice a small picture by Clinton Lovelidge, of Brooklyn, N. Y., "Forest Winter Scene." Woodland sounds are ever impressive, and in the mystery of its voices lies much of the fascination of the forest, but the effect of stillness which this scene conveys is almost painful in its intensity. A path on which the snow lies white and untrodden, opens directly through the woods without curve or break to divert the eye, and on either side the gray stems of the trees stand gaunt and weird like grim sentinels. E. H. Nichols, Esq., has a large painting "Scene on the White Mountains," the foreground is particularly good, and the rocks are very true to nature. The U. S. Machinery Carving Co., corner of Second avenue and 22d street, exhibit machine carving on wood and marble. There are many specimens of this carving, and those on wood are much superior to the efforts on marble. Among the latter are some alto and basso-relievos, and some bordering in intaglio; but there is not distinctness and clearness enough of outline: they have the smooth effect of casting, and we miss the sharply defined yet delicate and firm mark of the chisel. But for ornamentation in wood and all decorations of that kind, for cabinetware picture frames, and the numerous uses to which woods of different kinds are put—it is an adaptation of machinery of great value. The pattern or device once made, any number of duplicates can be carved directly from the block of wood, and the pattern can be placed at any desired angle, thus producing different effects from one pattern.

James Prentice, optician, 164 Broadway, New York, shows a handsome case of mathematical and drafting instruments, and the Willard Manufacturing Co., 684 Broadway, a collection of camera tubes and lenses. Both of these collections are worthy notice.

The Musketo Pest.

The cool weather we are now enjoying has not yet rid us of the pest of the musketo; any suggestion therefore for defending ourselves from their attacks will be welcome. The Philadelphia *Ledger* says:

"Of the various remedies proposed, none are so efficacious as the use of musketo netting in the windows and around the beds at night. But as this is not always practicable or convenient, we must resort to other means for bidding defiance to our enemies. Of these, the best is the smoke produced by burning a small quantity of what is technically called, "Persian Insect Powder." This consists of the powdered flowers, and perhaps young stems and leaves, of a plant known to botanists as *Pyrethrum caucasicum*, a kind of chamomile cultivated largely in Germany, resembling the common garden chamomile in many of its properties. and of which all the various "insect," "magnetic" and "fly" powders are wholly or entirely composed. For use against musketoes, a small quantity—about what could be heaped upon an old-fashioned silver dollar, if any of our readers remember the size of that coin—is placed at bed time on a plate, and the top of the heap touched with a lighted match until it shows a red coal. The mass will then smoulder gradually away, filling the room with a light smoke, which narcotizes the musketoes and keeps them quiet for several hours, after which it may be necessary to repeat the operation. The evolution of the smoke will be facilitated by stirring the burning powder from time to time, so as to secure perfect combustion, although this is not absolutely essential. The powder may be also twisted up in a light cylinder of paper, and burnt in that form. Its use, as described, against musketoes, gnats, etc., has long been known to the Chinese and Tartars, who mold it into sticks and burn in their tents and dwellings, which would in many cases be uninhabitable without it. The same substance, in its powdered state, is also used to great advantage in preventing the attacks of roaches, bedbugs, fleas, ants, etc., and in keeping flies off the dining tables. It is perfectly harmless to mankind, and may be eaten as freely as chamomile, and the smoke is not at all injurious. This latter, it may be mentioned in addition, has much the same effect on flies as on musketoes—not destroying them, but merely throwing them into a stupor.

"Carbolic acid, poured upon a rag and hung near the bed at night, also acts very favorably, by its powerful odor, in keeping away musketoes. This is, however, more disagreeable to most persons than the smell of the burning insect powder, which resembles that from a mild cigar."

OFFICIAL REPORT OF PATENTS AND CLAIMS

Issued by the United States Patent Office,

FOR THE WEEK ENDING OCTOBER 15, 1867.

Reported Officially for the Scientific American

PATENTS ARE GRANTED FOR SEVENTEEN YEARS the following being a schedule of fees:—

On filing each Caveat	$10
On filing each application for a Patent, except for a design	$15
On issuing each original Patent	$20
On appeal to Commissioner of Patents	$20
On application for Reissue	$30
On application for Extension of Patent	$50
On granting the Extension	$50
On filing a Disclaimer	$10
On filing application for Design (three and a half years)	$10
On filing application for Design (seven years)	$15
On filing application for Design (fourteen years)	$30

In addition to which there are some small revenue-stamp taxes. Residents of Canada and Nova Scotia pay $500 on application.

☞ *Pamphlets containing the Patent Laws and full particulars of the mode of applying for Letters Patent, specifying size of model required, and much other information useful to Inventors, may be had gratis by addressing MUNN & CO., Publishers of the Scientific American, New York.*

69,739.—Corn Planter.—Geo. Abbott, White's Corners, N.Y.

1st, I claim the clutch, I, and spring rod, K, in combination and arrangement with the gearing and planting apparatus of a corn planting machine, for the purposes and substantially as described.

2d. The planting leg, G, connected with the driving wheel by means of appropriate gearing, in such manner that the leg may be caused to move up by the mechanism, and let fall by its own gravity and plant hills at intervals, substantially as set forth.

3d, The seed gatherer, H, arranged with the seed box, O, partition, O', and tube, R, for the purpose of picking up and carrying the requisite number of kernels to form a hill and depositing the same in the planting leg, substantially as described.

4th, The valve, L, placed at the foot of the planting leg and operated by means of the rod, v1, lever, v2, and cam, F1, for the purpose and substantially as described.

5th, The spring rod, K, operating upon the dutch wheel, I, to advance or set the planting gear, substantially as set forth.

6th, The hill marker or projection N, near the foot of the planting leg, G, by which each hill is individually marked, substantially as set forth.

7th, The shield, P, placed in the seed box around the feed slide, for the purpose and substantially as described.

8th, The cam wheel, F, by which a planting leg and marker and a seed gatherer, either or all, may be operated, for the purpose and substantially as described.

9th, The vertical slide or seed carrier, H, arranged with the seed box, O, partition, O', and tube, and operated by the cam, F2, for the purposes and substantially as set forth.

10th, The slotted swivel joint, t2, as a means of connecting the pendant, t1, to the overhanging bar, T, for the purpose and substantially as described.

69,740.—Machine for Making Keys for Bolts.—Nathan Adams, Altoona, Pa.

1st, I claim the device for cutting the bar, consisting of the cam, n on the lever, F, die, B, and cutter, H, all made and operating substantially as herein shown and described.

2d, The combination of the gangs, h, with the cutter, H, die, B, and cam, n on lever F, substantially as set forth.

3d, The spring, K, provided with the pin, i, and cam, y, in combination with the bar, D, substantially as described for the purpose specified.

4th, The construction and arrangement of the slotted plate, A, pivoted dies, B C, arms, e e, pivoted bar, D. slotted rod, E, lever, F, having cam, n, cutter, H, stationary bridge, G, gage, h, spring, K, having cam, y and pin, i, all operating as described for the purpose specified.

69,741.—Railroad Switch.—Sidney Allen, Newton, and Jas. P. Snow, Roxbury, Mass.

1st, I claim the suspended pivoted guide shoe or shoes, F, constructed as described and arranged to be adjusted between the wheel, D, and the raised flange, K upon the elevated track, whereby said wheel is crowded off the

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raised track upon the branch track, as herein set forth for the purpose specified.

2d, The combination of the weighted or drop levers, H, with the suspended shoes, and frame, E, of the car, substantially as herein shown and described and for the purpose set forth.

3d, The combination of the operating levers, J, with the weighted levers, H, and with the frame, E, of the car, substantially as herein shown and described and for the purpose set forth.

4th, The raised and flanged guide block, K, constructed as described, connected with the rails of the track at the point where the branch track leaves the main track, substantially as herein shown and described and for the purpose set forth.

5th, The combination of the guide block, L, with the rails of the track at the point where the branch track leaves the main track, when used in connection with the depressed rail and deepened track, substantially as herein shown and described and for the purpose set forth.

69,742.—ARTIFICIAL LEATHER FOR FLOOR COVERINGS.—Stephen M. Allen, Woburn, Mass.

1st, I claim the sheets made by combining pulped or ground tanned leather scraps with vegetable fiber, and pulped untanned animal skins, to be used in the manufacture of floor coverings or carpets, substantially as before described.

2d, Sheets made by combining pulped or ground tanned and untanned animal fiber or scraps of skins with vegetable fiber, further combined with bullock's blood or fibrine, pulped and run off into sheets, substantially as before described and for the purposes specified.

3d, I claim the stuffing, painting, staining, or printing, in the manner and for the purposes specified, sheets made by combining tanned scrap leather and vegetable fiber with untanned scraps of hides, or with the further combination of bullock's blood or fibrine, manufactured substantially in the manner and for the purposes set forth.

4th, As a new article of manufacture, a floor covering or carpet made by first forming a sheet of leather scraps and vegetable fiber combined with untanned scraps of hides, or with the further combination of bullock's blood or fibrine, the whole manufactured substantially as herein set forth.

69,743.—CULTIVATOR.—A. H. Allison, Charlottsville, Ind.

1st, I claim the axles, d, in combination with ties, C C, when constructed and arranged as and for the purpose herein set forth.

2d, The beams, D D, the blocks, H H, the rod, m, the rods, g g, and the disks, h, the whole constructed and operating substantially as herein specified.

69,744.—SAW MILL.—Leonard Anderson, Painesville, Ohio.

I claim, 1st, The combination in the frame, A', of the vertical slideways, C", and diagonal tongues, G G', operating substantially as and for the purpose herein specified.

2d, The vertical slideways, C", when used to guide and carry the head of the saw, and at the same time to carry or support the jaws of the saw guides, N N, substantially as and for the purpose herein set forth.

69,745.—SAFETY VALVE FOR OIL STILLS.—Samuel Andrews, Cleveland, Ohio.

I claim the herein described safety valve constructed and applied to oil stills, substantially in the manner as and for the purpose set forth.

69,746.—WINDOW SASH FASTENER.—H. G. Arnolds, Rochester, N. Y.

I claim a sash lock composed of bolt, H, tumbler, G, and notched plate, arranged as and for the purposes set forth.

69,747.—PISTON PACKING.—Mifflin W. Baily, Westchester, Pa.

I claim spiral spring, S, catch spring, C S, applied to piston heads for pumps or any kind of engines, when combined with the packing of said piston head, for the purpose and in the manner above set forth and described.

69,748.—ASH SIFTER.—David W. Barker, New Haven, Ct.

I claim, 1st, In combination with the case, A, and serve or netting, B, the beaters, D, operating substantially in the manner herein set forth.

2d, In combination with the beaters, D, the handle, E, and case, A, I claim the protecting flange, a.

3d, The combination of the plates, m and n, and sleeve, i, with the beaters, D, and netting, B, when constructed so as to form the bearing for the beaters, substantially in the manner herein set forth.

69,749.—CART SADDLES.—John Bea, Newark, N. J., assignor to himself and Timothy D. Gladston, Boonton, N. J.

I claim, 1st, The plates, b b, attached to the bar or bow, A, one at each end, in combination with the plates, C C, having holes, c, made in them, and leather or other flexible material attached, which are stuffed to form pads, B, substantially as shown and described.

2d, The straps, D D, attached to the saddle tree between the ends of the bar or bow, A, and the plates, b b, when said straps are applied to or used in combination with a cart saddle constructed in the manner substantially as herein shown and described.

69,750.—CULTIVATOR.—H. Bean, Schuylkill, and J. D. Tyson, Lower Providence, Pa.

I claim, 1st, The combination with the main frame, A, of the levers, D, and brace rod, d, arranged to operate as shown and described.

2d, The sliding bar, I, provided with the cord, F, and chains, l, or their equivalents, when arranged to operate as and for the purposes set forth.

69,751.—WASHING MACHINE.—D. C. Bernhardt and S. F. Houston, Charlotte, N. C.

We claim the frame, C, having rollers, D, and supported by the springs, when the same is in combination with an inclined bearer frame having a roller, and the whole is constructed, arranged, and operated substantially as described.

69,752.—PROCESS OF OBTAINING USEFUL FIBERS.—Dana Bickford, Boston, Mass.

I claim, 1st, The preparation of the fiber of the above named weed, substantially as before described and set forth,

2d, The uniting the pulp or fiber with rubber and other gums, also the imitating of velvet plush and other articles, as described.

69,753.—DEVICE FOR LOCKING DOORS AND WINDOWS.—A. H. Boyd, Rockville, Mass.

I claim the system of bolts so connected and arranged that all the bolts may be simultaneously operated from one point, both to lock and unlock each bolt, also having an independent provision for operating it from the inside of the room, all substantially as set forth.

69,754.—SHOE HOLDER.—A. N. Breneman, Lancaster, Pa.

Antedated Oct. 12, 1867.

I claim the construction and combination of the front piece, A, and back piece, B, united by a hinge, C D E, in the manner and for the purpose specified.

69,755.—COMB.—James H. Briggs, Brooklyn, N. Y.

I claim the connector, B, constructed as described, when provided with right-angular flanges, a, fitting into longitudinal grooves cut into the comb, A, as herein set forth, for the purpose specified.

69,756.—COMBINED PUMP AND MEASURE.—J. M. Brooks and Perry Munson, Independence, Iowa.

We claim the arrangement of the scale rack, D, segmental pinion, G, and piston, B, in combination with the cylinder, A, nozzle, J, and faucet, H, substantially as and for the purpose set forth.

69,757.—CARRIAGE WHEEL.—Reuben Brooks, Jr., Rockport, Mass.

I claim, 1st, The metal clamp, C, constructed as described from a plate of metal, provided with the central hole, a, for the passage of the tenon of the spoke, the sides of said clamp bent around the joints of the fellys flush with the sides and tread and secured to the end of the tenon of the spoke by means of the holes, b, fitting therein as herein set forth, for the purpose specified.

2d, Joining the ends of the fellys of carriage wheels at the end of a spoke by means of the clamp, C, constructed as described, in such a manner that the tenon of the spoke shall pass through the hole, a, in said clamp, and firmly secured therein by the pressure of the ends of the fellys, as herein shown and described.

3d, Supporting the fellys by means of the shoulder of the spoke bearing against the outside of the plate, C, and firmly securing the ends of the fellys by means of rivet bolts passing through the holes, c c, in said clamp, substantially as described, for the purpose specified.

4th, The insertion of rivet bolts in the holes, c c, through a clamp securing the ends of the fellys of carriage wheels, for the purpose of tightening said fellys, substantially as herein shown and described.

69,758.—PUMP.—George Bruce, Corydon, Ind.

I claim the cylinder, A, piston heads, C, cam grooved disk, H, and connecting rods hung in said cam groove, when all are constructed and arranged together substantially as and for the purpose specified.

69,759.—DUMB WAITER.—F. B. Bryson, Newcastle, Pa.

I claim the arrangement of a dumb waiter for passing up through the floor of an upper room and the spring catch operated by the rod, h, in combination with the weight, g, and the spiring, n, substantially as and for the purpose herein described.

69,760.—HUB AND AXLE FOR VEHICLES.—D. M. Buckhout, Mount Kisco, N. Y.

I claim the cast metal hub provided with the circular chamber, b, and the mortises, f, to receive the tenons of the spokes, the projections, h, and the plate, G, to screw on the periphery of the chamber, b, in combination with the boxes, F F', fitted within the chamber, b, and the collar, C, and V-shaped flange, D, on the arm, A, all arranged substantially as shown and described.

I further claim the arm, A, fitted on the axle, B, and secured by set screws, a, substantially as shown and described.

69,761.—HAY SPREADER.—G. E. Burt, Harvard, Mass.

I claim, 1st, The shield, H, constructed and arranged substantially as described for the purposes set forth.

2d, The arrangement of the forks, J J, the arm, k, the shafts, a a and P, substantially as described and for the purposes set forth.

69,762.—WELL POINT.—Henry G. Cady, St. Louis, Mo.

I claim the manner of connecting the tube, K, to the point, B, and the tube, P, to the pipe, A, and to each other, as above described.

69,763.—PUMP VALVE.—H. G. Cady, St. Louis, Mo.

I claim a valve constructed of the cylinder, H, bevelled packing or seat, B, flexible ring, F, with its weighted tongue, A, all arranged substantially as shown and described.

69,764.—HAY RAKER AND LOADER.—Archibald Campbell, Peoria, Ill.

I claim, 1st, The rake head, H, when hinged to the rear cross bar of the frame, A, and provided with the teeth, I, bent in such a manner that the upper part of their front portions shall extend above the rollers, F, and return to the head, H, forming an acute angle, said teeth and rake head adjusted by means of the set screw, Z, in the upper part of the cross bar, as herein described for the purpose specified.

2d, The arrangement of the carrier frame, J, constructed as described, roller, K, upon its vertical part, carrier, L, pulleys, F, frame, A, and adjustable rake and teeth, H I, as herein described for the purpose specified.

3d, The arrangement of the adjustable pivoted frame, N, roller, P, carriers, L R, uprights, O, roller, K, and frame, J, as herein described for the purpose specified.

4th, The combination of the guides, S, with the upper carrier frame, N, substantially as herein shown and described and for the purpose set forth.

5th, The slotted uprights, O, in combination with the pivoted carrier, N and frame, A, for adjusting said carrier to the varying hight of the loaded hay, as herein shown and described.

6th, The combination of the bent lever or arm, V, and rod, W, with the rake shaft H, and frame of the machine, substantially as herein shown and described and for the purpose set forth.

7th, The arrangement of the levers, J, clutches, G D, shaft, E, rods, U, rollers, F, and shafts of wheels, B, as herein described for the purpose specified.

69,765.—VAPOR BATH.—M. B. Carleman, Chicago, Ill.

I claim, 1st, The cylinder or vessel, H, when divided into an upper and lower chamber by the block, K, substantially as and for the purposes specified.

2d, The reservoir or cup, J, when provided with a stop cock, I, in combination with the vessel, H, substantially as specified.

3d, The block, K, when provided with the recess, e, and one or more lateral passages, f, substantially as described.

4th, The vapor generator, H, when provided with the block, K, in combination with the pipe, G, constructed and operating substantially as shown.

5th, The cover, N, when provided with the opening or slit, k, and the lappels, O, constructed substantially as and for the purposes specified.

6th, The combination of the generator, H, cup, J, block, K, with the chair or couch, A B, and cover, N, substantially as and for the purposes specified

69,766.—DRAPERY HOOK.—Edwin Carrington, West Meriden, Conn.

I claim the herein-described drapery hook formed by an upward inclined slot, d, opening into a recess, a, in the metal of larger diameter than the width of the slot and formed upon a base so as to be secured, substantially as specified.

69,767.—ROPE OR LINE HOLDER.—A. J. Chase, Boston, Mass.

I claim, 1st, The combination with the supporting plate or bracket, c, and stud or curved projection, f, of the swivelled clamp, d, under the arrangement and for operation as set forth.

2d, The combination with the bracket, c, curved projection, f, and swivelled clamp, d, of the plate, a, and screw, or equivalent fastening device, formed in one piece with said plate, substantially as and for the purposes herein shown and set forth.

69,768.—BLANKET FASTENER.—L. C. Chase, Boston, Mass.

I claim, 1st, The arrangement of stud, c, and plate, b, in connection with each other and also with loop, d, when fastened to a blanket by means of shield, a, and rivets, e f, substantially as and for the purpose described.

2d, And in combination therewith the strap, g, slotted at h, when fastened to the blanket between shield, a', and twin washer, j, by rivets, e' f', as and for the purposes described.

69,769.—COMPOSITION FOR SAUSAGES.—J. L. Chevalier, Newark, N. J.

I claim in the preparation of sausages the combination of materials herein specified about in the proportion, as set forth.

69,770.—DEVICE FOR TURNING THE LEAVES OF BOOKS.—Cyrus C Clapp (assignor to himself and R. M. Burdick), Hartford, Conn.

I claim, 1st, In a leaf-turning device the combination of the pedal, r, shaft, s, arm, t, spring pawl, u, ratchet, n, for holding or releasing the wheels, i, substantially as described.

2d, I claim the clips, 1, with the cord, 3, secured loosely in the holes, 2, of the arms, i, substantially as and for the purpose described.

69,771.—TRACE FASTENING.—Lucas C. Clark, Plantsville, Ct.

I claim the cock eye, A, the guide or fastener, C, when attached to the whiffletree, B, the whole arranged and used substantially as described.

69,772.—VALVE FOR STEAM ENGINES.—James Colbath, Worcester, Mass.

1st, I claim the combination of the piston, B, constructed as described with the cylindrical piston valve, D, operating as and for the purpose set forth.

2d, The enlarged recesses, q', near the ends of the piston valve, D, in combination with the apertures, r r', communicating with the spaces, o o', in the steam chest, as and for the purpose specified.

69,773.—SASH FRAME.—J. E. Crowdery, Wheatland, Iowa.

I claim in a sash frame facing the meeting rails, A A, of each sash with metallic trough-shaped lips, B B, so that the tongue of each will enter the groove of the other when both sashes are closed, substantially as and for the purpose set forth.

69,774.—SCALES.—S. W. Cox, New Haven, Conn.

I claim a scale for weighing letters, etc., constructed so as to operate substantially as described.

69,775.—KNITTING MACHINE.—Thomas Crane, Fort Atkinson, Wis.

1st, I claim the application of pressure to the work at a point which is directly beneath each needle for the purpose of holding down the loops last formed during the ascent of the needles thus maintaining such a condition of the loops as will ensure their being cast off from the needles with certainty, substantially as described.

2d, The pressure bars, j, applied to a sliding frame, G, or its equivalent, which moves in concert with the yarn carrier, g, substantially as described.

3d, Providing for moving the device which holds down the work to one side of the jacks when not required to work between the jacks, substantially as described.

4th, The combination of one or more pressure bars, j, or their equivalent, with one or two straight rows or needles, substantially as described.

5th, Extending the ends of the jack frame beyond the ends of the rows of jacks so as to admit of the removal of bars, j, longitudinally from between the jacks, substantially as described.

69,776.—KNITTING MACHINE.—Thomas Crane, Fort Atkinson, Wis.

1st, I claim the employment of spurs or combs arranged and operating substantially as described for the purpose of holding the work in proper position during the ascent of the needles.

2d, The notched plates, J J, in combination with levers, p p, or other equivalent means for moving the slotted bars, G G, and the comb spurs, substantially as described.

3d, In combination with a knitting machine having one or two straight rows of needles, I claim holding the work down in place during the ascent of the needles by a device or devices arranged beneath the needle beds, substantially as described.

69,777.—ANIMAL TRAP.—John Curtis, St. Charles, Minn.

I claim the combination of the sliding gate, C, springs, D, lever, E, wire loop, H, cord, I, and forked rod, J, or its equivalent, with each other and with the box, A, substantially as herein shown and described and for the purpose set forth.

69,778.—HOSE COUPLING.—M. S. Curtis, New York City.

1st, I claim securing the parts, A and B, of the coupling to each other by means of the sliding blocks, C, substantially as herein shown and described.

2d, Operating the sliding blocks, C, by means of eccentric grooves formed in the movable part, D, of the coupling, substantially as herein shown and described.

69,779.—BED BOTTOM.—W. F. Dougherty, Mt. Pleasant, Iowa.

I claim the clevis, E, as constructed and arranged in combination with the spring, C, and hook, c, substantially as described and operating as set forth.

69,780.—BROOM CLAMP.—Justus Day, Holley, N. Y.

I claim the employment of caps or blocks, M M, attached outside the clamp and leaving the slot or space, D, for the winding of the wire, as herein set forth.

69,781.—ARCH BARS AND SUPPORTS FOR CONSTRUCTING FURNACES FOR EVAPORATING PANS.—Gaius S. Deane, Grand Rapids, Mich.

1st, I claim the bars, A B and C, constructed substantially as herein shown and described for the purpose of supporting evaporating pans upon arches in making sugar and for similar uses.

2d, The double andiron, D, constructed substantially as herein shown and described and for the purpose set forth.

69,782.—STEAM GAGE COCK.—T. B. Dexter, Lynn, Mass.

I claim a gage cock provided with the double headed valve, c, arranged to operate in combination with the valve seats, M and N, located at opposite ends of the chamber, B, substantially as shown and described.

69,783.—ALLOY FOR JOURNAL BOXES AND OTHER PURPOSES.—G. W. Disman, Chesterville, Ohio.

I claim a composition for journal boxes, bearings and other mechanical purposes, composed of copper, glass, borax, prussiate of potash and tin as herein described and for the purposes specified.

69,784.—APPARATUS FOR SEPARATING GOLD, ETC.—William T. Duvall, Georgetown, D. C.

1st, I claim the series of chambers or traps, e, so constructed and arranged that greater freedom of egress is afforded in each successive chamber, whereby the velocity of the current is reduced and the heavier particles are deposited successively therein according to their specific gravity, substantially as and for the purposes set forth.

2d, In combination with said series of chambers, e, a centrifugal or other suitable pump to force the current and at the same time to agitate the earthy liquid, substantially as and for the purposes specified.

3d, The arrangement of the pump at the top of said series of chambers so as to operate the apparatus by producing a vacuum therein, essentially as and for the purposes described.

4th, The arrangement and combination of the pump and the series of chambers, e, as shown in Fig. 8, with the straight suction pipe, J, essentially as and for the purpose set forth.

5th, In combination with said series of chambers, e, I claim the pipe, D, for operating by a column or head of water, substantially as described,

6th, I claim the chambers, e, constructed in separate parts, as represented, the nozzle of each protruding into the chamber of the next forming annular receptacles, substantially as and for the purposes specified.

69,785.—GRAIN DRIER.—J. R. Evertson, Mount Vernon, Ind.

1st, I claim the combination of two or more furnaces, D E, with the oscillating pan, A, in such a way that the flue of each preceding furnace may open into the upper part of the succeeding furnace, substantially as herein shown and described and for the purpose set forth.

2d, Forming offset, shoulder or step, a', in the oscillating pan, A, at or near the point or points at which the flue of the preceding furnace enters the upper part of the succeeding one, substantially as herein shown and described and for the purpose set forth.

3d, Forming one or more openings or slits, h', in the cover, H, at or near the offset or offsets, a', substantially as herein shown and described and for the purpose set forth.

69,786.—METHOD OF SLOTTING THE LIPS OF RAILROAD CHAIRS.—David Eynon, Richmond, Va.

I claim the method herein described of slotting railroad chairs.

I also claim the hooked cutter, constructed as described.

69,787.—DEVICE FOR TRANSMITTING ROTARY MOTION.—L. B. Flanders, Philadelphia, Pa Antedated Oct. 1, 1867.

I claim the shaft, B and C, geared together and each furnished with a worm, f, gearing into a wheel, D, in combination with an adjustable frame, E, shaft, F, and bevel wheel, I, gearing into a bevel wheel on the shaft, O, the whole being constructed and operating substantially as described.

69,788.—GATE.—Daniel Flint, Sacramento, Cal.

I claim the combination and arrangement of a crotched hinge, F, with forked arms and the cords, G G', and weights, I I', with the automatic catches, N N', all substantially as described and for the purposes set forth.

69,789.—WAGON REACH.—E. F. Flood, Chicago, Ill.

1st, I claim a curved or bent reach when so constructed that the line of draft is the same as in the straight reach and so that the reach rests on and is supported by the sway bar as in the ordinary reach substantially as and for the purposes set forth.

2d, The curved reach, A, in combination with the iron, e, of the sway bar when such iron is extended and so constructed as to furnish a support for the reach in all positions substantially as and for the purposes mentioned.

69,790.—FURNACE FOR STEAM BOILERS, ETC.—H. K. Foote, Oil City, Pa.

1st, I claim the combination with a furnace of the retort, A, constructed substantially as described when arranged to be used in connection therewith for the purposes set forth.

2d, The combinat on and arrangement substantially as described of the retort, A, within a furnace and connected to the boiler by the pipe, F, and with the reservoir, H, as described.

3d, The admixture of air by means of an air pump or its equivalent with the gases obtained from the decomposition of steam by means of the heated carbon in the retort before ignition when used in combination with an ordinary furnace substantially as described.

4th, The admixture of the vapor of hydro-carbon in the manner described with gases obtained from the decomposition of water or steam in the manner described for the purpose of generating heat in connection with the furnace of steam boilers substantially as herein described.

69,791.—DAMPER.—I. L. Frankem, Indianapolis, Ind. Antedated Sept. 14, 1867

I claim a draft regulator having tube, A, conduit, B, rod, D, and a series of cut-offs as described substantially as herein specified.

69,792.—PUMP.—W. A. Fry, Worcester, Pa.

I claim the within described body of a pump composed of the three detachable sections, a a1 and a2, connected together and inclosing passages and chambers all substantially as described.

69,793.—BUCKLE.—J. M. Gaston, Lyons City, Iowa.

I claim the buckle frame, E, and stops, D D, when constructed arranged and operating substantially as and for the purposes set forth.

69,794.—HAY RAKER AND LOADER.—Austin Godfrey, Dupage, Ill.

I claim the adjustable rake, a a a, in combination with the shoe, h.

2d, The revolving cylinder, e, in combination with the adjustable rake, a a a, shoe, h, and elevator, f f f when constructed and operating in the particular manner and for the purposes set forth.

3d, The frame, i, with its fastenings to the main frame, b, as set forth in combination with the cylinder, e, and rake, a a a, and reach or fastener, g, when constructed and operating conjointly in the particular manner set forth.

69,795.—CHURN.—M. C. Gordon, Knightstown, Ind.

1st, I claim the dash, C, with tubes, D D' D" D"', etc. Fig. 2 with gradually tapering diameters by means of which dash and tubes the milk is forced upward in jets and the globules containing the butter broken and thereby the separation of the butter rapidly and effectually accomplished substantially as and for the purpose set forth.

2d, The dash, C, tubes, D D' D" D"', etc. Fig. 2 in combination with breaker, E, Fig. 2 so arranged that the milk when forced in jets through tubes, D D' D" etc., in dash, C, is violently thrown against the breaker, E, and the breaking or the globules or particles of milk and the separation of the butter therefrom is rapidly and effectually accomplished substantially as and for the purposes set forth.

69,796.—MEDICAL COMPOUND.—D. C. Gould, Sterling, Ill. (assignor to himself, Elizabeth A. McCartney and Ephraim F. Brock.

I claim a medical compound composed of creasote, sulphuric acid, tincture of opium, tincture of Kino and sulphuric ether combined and prepared substantially as specified.

69,797.—APPARATUS FOR COOLING LIQUIDS.—Marcus Gould, New York City.

1st, I claim the channel, A, in combination with the air passages, C, either with or without the water passages, B, as and for the purposes specified.

2d, The air passages, C, and the chimney, D, when arranged and operating with the channel, A, and water passage, B, substantially as described and for the purposes specified.

69,798.—HEAT-RADIATING ATTACHMENT FOR STOVE PIPES.—John Grabner, Warsaw, Ind.

I claim the combination of racks, B B, pinion, P, Cap, M, flange, n, and rod, D, arranged to operate the damper cones, F G H, substantially as and for the purpose set forth.

69,799.—PANEL TABLE.—J. G. Greene, Port Henry, N. Y.

I claim the combination of the sliding pivoted panel, B, with the grooved frame, A, in which it works and with the top or cap, D, of the article or casing substantially as herein shown and described and for the purpose set forth.

69,800.—COMBINED DOOR PLATE AND LETTER BOX.—J. T. Green, Marquette, Wis.

1st, I claim the door plate, C, provided with sliding panels, b b, in combination with panels, a g, substantially as and for the purpose set forth.

2d, The letter box, H, provided with the serrated guard plates, D E, door, F, and inclined bottom, h, in combination with the door, slat, B, and plate C, all arranged and operating substantially as and for the purpose herein set forth.

3d, The combination of the door plate and register provided with the springs, c', and mail box provided with protectors all arranged combined and operating as and for the purpose set forth.

60,801.—CULTIVATOR.—Dan Guptail (assignor to himself and and H. N. Mosely, Elgin, Ill.

I claim the elastic or spring shovel, B, in combination with wedge or key, L, substantially as and for the purpose set forth.

69,802.—SELF-ACTING FLY FAN.—W. D. Harrell, and H. M. Hall, Osgood, Ind.

1st, We claim the arrangement of base, A, stud shaft, B, and revolving frame, C, furnished with two distinct sets of clock work, for reciprocating and horizontally rotating motion of one or more fans either singly or combined as set forth.

2d, The provision of the hinged connections, of the fans arms for the purpose stated.

3d, In combination with the object of the first claim we claim the stops, H and Q, for arresting the rotary and vibrating motions of the fans either jointly or severally.

69,803.—GARDEN PLOW CULTIVATOR.—C. A. Harris, Austin, Ark.

I claim the peculiar combination of the several parts forming a valuable and efficient garden cultivator or hand plow, set forth in accompanying drawings and described in specification whether constructed of wood, metal or any other material substantially the same or answering the same purpose.

69,804.—WAGON JACK.—T. S. Harris, Lockport, Ill.

I claim the peculiar and particular combination and arrangement of the parts described as and for the uses and purposes set forth.

69,805.—CARRIAGE TONGUE HOLDER.—Thompson Heaton, Farmington, Ill.

I claim the following only viz, the metallic staple and roller or lining in upper end of leather holder with the form of the holder all in the combination and for the uses herein substantially as set forth.

69,806.—HOUSE FOR PRESERVING FRUITS AND OTHER ARTICLES.—N. Hellings, Philadelphia, Pa.

I claim the arrangement of the walls floors and ventilating apparatus as above described, the use of wooden surfaces with non-conducting or poor conducting linings or blank spaces between all inner surfaces and the outer walls or the earth, the arrangement of ventilating entrances at the level of the ice floor with hatches opening down to the storage rooms and enclosed spaces to carry off bad air through the mass of ice upward when it is light air and downward out at the bottom of the entrance doors when it is carbonic acid gas, or like heavy air, as described above the light air passing through the upper space above the ice and thence out at the windows of the observatory.

And I claim the arrangement of the ice floor as described the arrangement to prevent dripping, from this floor, the open space between the joists on which the iron floor lies the copper covered narrow pitched roof to receive water from the melting ice and the suspended drip floor on which this water falls before passing off in the drainage troughs.

And I claim the combination of all these parts and devices as making up a whole all parts of which are essential to the preservation of the air pure and at the necessary low temperature and free from any excess of moisture or any deposit of moisture on the floors, walls, or any part of the storage chambers.

69,807.—BALING PRESS.—G. H. Hoke, and J. A. Brown, Elizabeth, Ind.

I claim the combination and arrangement of the toggle joint with arms, E E', connected by the strap, b, the beater, D, the stirrup, G, and the lever, H, constructed and operating substantially as and for the purpose herein described.

69,808.—METALLIC CHAIR.—A. W. Hopkins, New York city.

I claim a chair or seat formed with a back or seat of interlaced and corrugated or undulating wire and galvanized or tinned after the chair has been made as and for the purposes set forth.

69,809.—FARM FENCE.—D. S. Humphrey, East Townsend, Ohio.

1st, I claim the herein described fence when the wires employed in its construction are so arranged as to support the slats or pickets, in the manner substantially as set forth.

2d, The arrangement of the wires, B, and pickets, D, in combination with the posts constructed as and for the purpose set forth.

69,810.—WAGON JACK.—John Hunt, Jr., West Hampton Township, N. J.

I claim the box, A, hinged plate, C, lever, A1, and the ratchet prop, B, substantially as and for the purpose herein shown and described.

69,811.—PACKING FOR JOINTS, VALVES, ETC.—Nathaniel Jenkins, Boston, Mass.

1st, I claim the employment of pulverized mica, intimately mixed before vulcanizing, with the constituents of vulcanized rubber, as and for the purpose described.

2d, And the employment of pulverized wood charcoal, intimately mixed before vulcanizing with the constituents of vulcanized rubber, as and for the purpose described.

69,812.—REFRIGERATOR.—John C. Jewett, Buffalo, N. Y.

I claim constructing the ice box of refrigerators with the arched bottom, d, in combination with the legs or depressions, e e, provided with perforations, f f, and the shallow pans, j j, arranged and operating as and for the purposes set forth.

I also claim the combination of the door, G, and lid, P, with the ice box, B when constructed, arranged, and operating substantially in the manner and for the purpose specified.

69,813.—MANGLE.—Johan Johansen, Springfield, Ill.

1st, I claim the frame or bar, E, pivoted at its ends to the ends of the weight box of the mangle, and having an endless rack and an endless groove formed upon its side, substantially as herein shown and described and for the purpose set forth.

2nd, The combination and arrangement of the pinion wheel, J, shaft, G, and adjustable slotted support or bearing, I, with the pivoted frame or bar, E, and with the slotted bar, F, substantially as herein shown and described and for the purpose set forth.

3d, The combination of the rollers, N, with the projecting ends of the bear

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ing, I, and with the frame or bar, E, substantially as herein shown and described and for the purpose set forth.

69,814.—CROSSING FOR STREET RAILWAYS.—Chas. W. Jones, (assignor to himself and Hiram W. Stout), Philadelphia, Pa.

1st, I claim a cruciform plate, E, combined with the rails of a street railway at the intersection of the same, substantially as described.

2d, The beveled ends, m m, of the treads, for the purpose specified.

69,815.—LAMP.—Anson Judson, Brooklyn, N. Y.

1st, I claim the construction of the burner of a flat-wick kerosene or coal oil lamp, with two or more stationary supports, D and F, or their equivalents, said supports being permanently attached to the burner, or forming portions of the same, and extending upward above the body thereof, substantially as and to the effect hereinabove set forth.

2d, The catch or device, G, or its equivalent, substantially as and to the effect specified.

3d, The combination of the stationary supports, D and E, and clasp, F, and burner, B, or their equivalents, as and to the effect specified.

4th, The construction of the catch, G, in one piece, with the clasp, F, substantially as herein specified.

69,816.—MACHINE FOR MAKING PATCH BOLTS.—Joseph Kaylor, Reserve Township, Pa.

I claim, in a machine for making patch bolts, the arrangement and use of a pair of recessed dies, which, when brought together, form a cylindrical cavity for the shank, and a conical cavity for the shoulder of the bolt, in combination with a swage or upsetting tool, having a cavity of polygonal cross section for shaping the head, and at the same time, upsetting the shoulder of the bolt in the conical cavity of the dies, constructed and arranged substantially in the manner and for the purposes hereinabove set forth.

69,817.—SPARK ARRESTER.—Patric Kelly, Nashville, Tenn.

I claim the combination of the spark arrester, F, cone, E, flue, D, drum, C, cap, G, conductor, J, tube K, band, H, and adjustable ring, c, as herein set forth for the purpose specified.

69,818.—MACHINE FOR COMPRESSING CARRIAGE WHEELS.—Henry Killam, New Haven, Conn.

I claim the combination and arrangement of the jaws, B, and their guides or plates, A, with the plate, C, when constructed so as to operate substantially in the manner herein set forth.

69,819.—AXLETREE FOR WAGONS.—Geo. P. Kimball, San Francisco, Cal.

I claim the combination with a superposed wooden axle bed of the steel plate or spring axletree, A, constructed and arranged for operation substantially as herein shown and for the purposes set forth.

69,820.—HOT-AIR FURNACE.—A. Kohler, Boston, Mass.

I claim, in combination with the flame chambers, f and x, and the hot-air chambers, g and n, the arrangement of the series of flues, l, running from the chamber, x, into a flue chamber directly under the main flue, e, and over the flame chamber, f, substantially as shown and described.

69,821.—APPARATUS FOR ACCUMULATING POWER.—Jas. F. Latimer, Detroit, Mich., assignor to Eliza Ellsworth.

1st, I claim the combination and arrangement of the rods, M M, the rocker, N, the lever, R, the base, O, and the pivot, P, arranged substantially as described for the purpose designed.

2d, The combination and arrangement of the frame, A A, the base, B, the pillow blocks, C C, the shaft, D, the wheels, E E, the slotted segment, F F, the eccentric levers, I I, the rods, K K K K, the shafts, L L, the rods, M M, the rocker, N, the base, O, the pivot, P, the lever, R, and the balance wheel, S, arranged substantially as described and for the purpose designed.

69,822.—JOURNAL BOX.—Edward F. Light, Worcester, Mass.

I claim the combination of the projection, D, oil hole, g, and grooves, d d and e, and inclined ways, f f, and chamber, c, with the bottom part, A, of the journal box, for the purposes stated.

69,823.—CURTAIN FIXTURE.—Henry Lovie, Philadelphia, Pa., and Albert Lovie, Prussia.

We claim the sliding screw rod, B, in combination with the pin or stud, C, and the roller, D, either fixed or revolving, substantially as shown and described.

69,824.—BUTTER DISH.—D. T. Lyon, West Meriden, Conn.

I claim the bearings of a revolving dish cover, constructed in the manner described, and so as to be attached or detached, as specified, that is to say, the slotted cylinder, a, upon each side of the dish, combined with a bearing fixed to the cover, either with or without the tumbler, f.

69,825.—EXPANSION DRILL.—Gilbert Mackinnon, Portsmouth N. H., assignor to himself and Hosea Crane, Millbury, Mass.

1st, I claim the arrangement of the cutters, E, in the recess, e, of the holder, A, and held in position between the holders and plate, B, by means of the set screws, as herein shown and described.

2d, The arrangement of the holder. A, plate, B, screw, D, wedge, C, and cutters, E, substantially as described for the purpose specified.

69,826.—IMPLEMENT FOR STRAINING BANDS ABOUT BOXES.—Samuel Marden, Newton, assignor to himself and Charles Porter, Cambridge, Mass.

I claim an implement for hooping boxes in which the lever, A, and bar, B, are combined with the yoke, c, substantially in the manner and for the purposes herein shown and described.

69,827.—MANUFACTURE OF CARRIAGE CLIPS.—Edwin Meeker, Bridgeport, Conn.

I claim dies, C and D, having recesses, d and e, and projecting punches, f, substantially as and for the purpose herein shown and described.

69,828.—WIND WHEEL.—E. W. Mills (assignor to the Empire Wind Mill Manufacturing Company), Syracuse, N. Y.

1st, I claim the sliding weights, d d, upon the rods, c, arranged to operate upon the wind wheels, B, through the medium of the bell crank, b b, and sliding collar, a, substantially as herein shown and described.

2d, The weighted lever, L, in combination with the rod, o, the connecting chains collar, a, bell cranks, b, rods, c, sliding weights, d, and wind wheels, B, substantially as described for the purpose specified.

3d, I claim the bell crank, b b, the rods, g h and f, the ball connection, n, and the rod, o and p, arranged and operating substantially as and for the purpose specified.

69,829.—ARTIFICIAL LEG.—Henry L. Mills, St. Paul, Minn.

1st, I claim the adjustable and movable leather socket, C, constructed, applied, and operating substantially as and for the purposes herein described.

Second, The combination of the iron frame, g g, secured by rivets to the ankle piece, B1, the bands, h h1, the straps, k1 k1, and the socket, C, all constructed, arranged, and operating substantially as and for the purposes set forth.

3d, The spring bar, n, pivoted to the band, h, in combination with the socket, C, arranged and operating substantially as and for the purpose specified.

4th, The plates, d d1, on the upper and lower sides of the heel of the foot, A, secured by the rivets, e e, substantially as and for the purposes described.

5th, The peg, B, and ankle piece, B1, pivoted to the plate, b, and fitted in the mortise, a, in combination with the frame, g g, and the foot, A, constructed, arranged, and operating substantially as and for the purposes herein set forth.

69,830.—BAKING PAN.—G. W. Mitchell, New York city.

1st, I claim the combination roll, cake, and bread baker, consisting of a heater, and roll or cake pan, substantially as and for the purpose as described.

2d, The heater, B, having apertures, a, in combination with the depressions, , and pans, substantially as described for the purpose specified.

4d, In combination with the heaters, B, and pans, C, I claim the legs, F, as herein described for the purpose specified.

69,831.—KNEELING CASE FOR CHURCHES.—L. Mooney, Baltimore, Md.

I claim the combination of the case, c, with an umbrella rack attached, with a gutter beneath, substantially as and for the purposes set forth.

69,832.—STUMP EXTRACTOR.—Gairet J. Olendorf, Middlefield, N. Y.

1st, I claim lever beam, C, supported in the center by croched pieces or frame, operating as described for the purpose specified.

2d, I claim swivel, reel, or straight hitch-up hooks, or snibil and hook, combined with and operated by lever beam, C, as described and set forth, for the purpose specified

3d, I claim ropes, R R, hitched to either the stump or frame going over pulleys in the beam to the axle or windlass by which the machine is operated, when used as described and set forth for the purpose specified.

69,833.—ICE-CREAM FREEZER.—O. Paddock, Watertown, N. Y.

1st, I claim, in an ice-cream freezer, in which the cream vessel is arranged to rotate upon its axis, as described, the combination with the cream vessel of a stationary cover which constitutes the bearing in which the upper portion of said vessel is supported and moves during its rotary movement, substantially as shown and set forth.

2d, The combination in an ice-cream freezer, as described, with the cream vessel and spindle for rotating the same, of the cover for said cream vessel and cross bar, to which it is attached, under the arrangement, substantially as herein shown and specified.

3d, The combination with the stationary cream-holder cover and the stop or catch which it carries, of the frame, F, mounted upon the spindle and within the rotary cream holder, substantially in the manner and for the purposes set forth.

4th, The combination of the cross bar and the bolts or latches pivoted to it as described, with the catches mounted on the ice tub, and the slots formed in the said tub, under the arrangement and for operation substantially as set forth.

5th, The combination with the cream vessel or holder and catches or hooks upon its bottom, of the slotted center bearing upon which the said vessel is supported and pivoted, substantially as and for the purposes described.

6th, The method herein indicated of facilitating the removal of the frozen or solidified cream from the vessel in which it is contained by forming in the bottom of said vessel one or more vents or openings for the admittance of air to the interior of said vessel while the cream is passing out from the same, the said vents being closed by screw plugs or other suitable means, as set forth.

69,834.—PLOW WHEELS.—L. E. Palmer, Le Roy, La.

I claim the construction and arrangement of the wheel, A, shaft, B, and braces, D D D, and irons, E E, in connection with the wheel, C, which supports the front of the beam, as shown and described.

69,835.—WASHING MACHINE.—John Park, Joliet, Ill. Antedated Oct. 3, 1867.

I claim the conical perforated bottom, in combination with the coiled spring, h, and rollers, d, when attached to a tub, and arranged and operating in the manner described.

69,836.—CORN PPANTER.—T. H. Parker and Daniel Kellison, Parkersburg, Ill.

1st, We claim the combination with the shovel, G g1, of the arm, H, bolts, a, and chain, I, whereby said shovel is made transferable, substantially as and for the purpose set forth.

2d, The combination of the frame, A A1 A2 A3, hopper, C, and its appurtenances, roller, K, hooks, J J1, lever, D, conducting tubes, F, and shovels, G, with their accessories, G g H a I, all arranged and operating substantially as herein described and represented.

69,837.—STOVE.—Moses Pond, Boston, Mass.

I claim the combination and arrangement of one or more blocks of india-rubber, or its equivalent, with the plates and the confining bolt or bolts of a stove, the whole being substantially as and for the purpose above specified.

69,838.—HARVESTER.—K. H. C. Preston, Manlius, N. Y.

I claim the shaft, D, having bearings, C, at or near the rear of the platform, A, its arms, b, provided with eyes, a, supporting the shaft, C, having at one end the crank, E, and provided with the teeth, d and e, all arranged and operating as described for the purpose specified.

69,839.—STEAM ENGINE.—George H. Reynolds, Mystic Bridge, Conn.

1st, I claim connecting the equilibrium valve, t3, and throttle valve, t4, so that both shall be operated together, substantially in the manner and for the purpose herein set forth.

2d, I claim the within described arrangement of the condenser, L, air pump, G, and discharge pipes, V, relatively to the cylinder, A.

3d, I claim the relief valve, U, arranged as represented, and adapted to transform the engine from a complete non-condensing engine, and the reverse, substantially in the manner and for the purpose herein specified.

4th, I claim arranging the foot valve, I, on the seat which is connected with the bonnet, J, and adapted to be raised and lowered therewith, substantially as and for the purposes herein specified.

5th, I claim operating the gridiron valves, N, on the back of the main slide, M, moving across by a movement later than the movement of the main slide, substantially as and for the purposes herein specified.

6th, I claim the link, Q, arranged to act obliquely to the eccentric rod, r, by the same eccentric so as to operate the gridiron valves, N, or their equivalents by means of one of the main eccentrics, R, substantially as and for the purpose hercin specified.

69,840.—SASH FASTENER.—Stephen N. Richards, Chicago, Ill.

I claim the combination of the sliding catches, B B, knobs, C C, and springs, S S, with the exterior metallic sheath or enclosure, A, substantially as and for the purpose described.

69,841.—HANDLE FOR STOVE DOORS.—Charles H. Roberts, Troy, N. Y.

I claim the wooden knob, A, constructed as described, slotted to fit over the metal knob, a, cast on the stove door and held in position by means of the ring, B, substantially as and for the purpose specified.

69,842.—TERRASPHERE.—Eleazer Root, Terra Haute, Ind.

I claim, 1st, The arms, E, sustaining the north end of the axis of the earth, A, combined with the axis, c, and the gear connection with the axis, B, so as to preserve its vertical position throughout the revolution of the earth in her orbit, substantially as described.

2d, Hanging the index, g, at the south pole of the earth in a tubular bearing substantially as described.

69,843.—CHURN.—Eli W. Russell (assignor to S. S. Russell, Ashley, Mo.

I claim the combination of the shaft, a, having the pulley, F, fly wheel, G, and crank, e1, secured thereto, with the shaft, b, having the pulley, E, and crank, c, when arranged so as to have the pitman, h, and crank, d, applied to either at will, substantially as and for the purposes herein described.

69,844.—COMPOUND PROTRACTOR.—William Rutherford, Athens, Ga.

1st, I claim the solid, base, B, projecting at right angles to the plane of the graduated semi-circle, so as to slide along the edge of the drawing board, considered as a meridian line, in combination therewith, and with the graduated rule, constructed as herein described.

2d, I claim, also, the fixed vernier, b, and the sliding vernier, c, in combination with the scale rule, C, and the protractor, A, arranged and applied as and for the purposes herein specified.

69,845.—TATTING SHUTTLE.—S. Schofield, Plainville, Mass.

I claim, 1st, A tatting shuttle provided with a detachable handle or holder, B, substantially as and for the purpose specified.

2d, A tatting shuttle provided with mechanical means for winding the thread upon it, substantially as herein shown and described.

3d, In combination with the scuttle, A, the holder, B, crank, C, and the crank bolt, i, the whole arranged substantially as and for the purpose specified.

69,846.—COMPOSITION FOR INK.—J. Shaw, Bridgeport, Conn.

I claim an ink compound, of the ingredients herein above named, and mixed together in the manner and in or about the several proportions, substantially as specified.

69,847.—VENTILATING ATTACHMENT FOR RAILROAD CARS.—J. Shaw, Bridgeport, Conn.

I claim the ventilator constructed as described, consisting of the box, B, having the pivoted lids, D, in the ends, C, opening inward against the ends of the inclined partition plates, H, the sides, F, provided with the funnel shaped or tubular openings, E, in which the pivoted inward projecting partitions, G, work, all arranged and operated as herein shown and described, for the purpose specified.

69,848.—SEEDING MACHINE.—B. A. Shearer, Crown Point Center, N. Y.

I claim the roller, G, provided with the grooves, d, and adjustable bars, e, in combination with the seed hopper, K, and chute, L, all arranged to operate substantially in the manner and for the purpose set forth.

I also claim the harrow or covering teeth, h, attached to the bars, M, which are fitted on the rod, N, in combination with the transverse bar, N', arranged and connected to the lever, P, to operate in the manner substantially as and for the purpose specified.

69,849.—COTTON BALE TIE.—J. L. Sheppard, Charleston, S.C.

I claim a tie or lock for metal bale hoops, composed of a metal plate perforated as shown at a, provided with loop, b, slots, a' a', and bent portion of the plate, C, to admit of the attachment of the ends of the hoop as shown, and the turning up or down of the tie or lock, while one end of the hoop is passed through its loop, b, and drawing up or down of the tie or lock, parallel with the side of the bale, under the expansion of the same, when relieved of the pressure, substantially as set forth.

69,850.—FOLDING SEAT.—George Sherwood, Chicago, Ill.

I claim the combination and arrangement of the lugs, c c', slots, d d', axle, b, hub or cup, e, and screw or nut, i, with the standard, a, and arm, D, substantially as and for the purposes specified.

69,851.—TOY PISTOL.—W. J. Shipman, Portsmouth, Ohio.

I claim a toy pistol, constructed and arranged to operate in connection with a bail, substantially as described, for the purpose specified.

69,852.—MINERAL PAINT.—Jacob R. Smith, Keyport, N. J.

I claim a paint composed of the ingredients herein named, in the proportions and in the manner substantially as described.

69,853.—MACHINE FOR CUTTING TOBACCO.—Jared W. Smith, New Haven, Conn. Antedated October 3, 1867.

I claim, 1st, The beam or frame, F, arranged to revolve, and provided with one or more revolving circular knives, G, substantially as described, for the, purpose specified.

2d, The scraper, H, in combination with the revolving circular knives, G, substantially as and for the purpose described.

3d, The sharpening rollers, J, in combination with the knives, G, substantially as and for the purpose specified.

69,854.—MACHINE FOR MOLDING PIPE.—Wm. Smith, Pittsburgh, Pa.

I claim, 1st, A revolving packer, g', tapering at or toward its upper end, and provided on the face or faces of such taper with grooves, i,' or projecting flukes in lieu thereof, constructed and operated substantially as and for the purposes hereinbefore set forth.

2d, The revolving hollow shaft, g, carrying a packer, g', in combination with the guiding shaft, b, and flask, B, arranged and operating substantially as and for the purposes above set forth.

3d, The drums, f, ropes, h', and cross bars, h, in combination with the collar, o', for the purpose of elevating the hollow shaft, q, while the mold is being formed, substantially as above set forth.

4th, The gear wheel, c, bored in the line of its axis for a seat for the guiding frame shaft, b, and keyed thereto in combination with drums, f and the apparatus, h and h', to engage the collar, o', for the purpose of imparting to the shaft, b, revolving and vertical motions, substantially as set forth.

5th, The vertically moving slide, n, with its converging grooves, n', in combination with the laterally moving clamps, m, having lugs, m', arranged and operated substantially as described.

69,855.—CHURN.—J. H. Spelman, Bazetta, Ohio.

I claim the special construction of the dasher, C, with slanting arms, I, and beaters, G F, when arranged so as to describe unequal circles, one within the other, in combination with the case, A, in the manner as and for the purpose set forth.

69,856.—AUTOMATIC RAILROAD SWITCH.—George W. Starr, Clarksburg, West Va.

I claim, 1st, The lever, G, in combination with the slotted arm, i, and spring, v", when arranged to operate in connection with the rail, A, the connecting rods, j and l, and spring, k, as described, and for the purpose set forth.

2d, The lever, F, in combination with the spring in the case, d, the rest, f, and rail, A, when arranged to operate as described, and for the purpose set forth.

3d, The trippers, t t', in combination with the bars, n, and o, when arranged to operate the lever, F, for releasing the rail, A, as described, and for the purpose set forth.

4th, An automatic railroad switch, with the devices for locking and releasing the rails, A A', when arranged to operate as described, and for the purposes set forth.

69,857.—HORSE HAY FORK.—B. F. Stewart, Freeport, Ohio.

I claim the curved prongs, B B, pivoted at one end to the handle, A, and connected by the link, a, pivoted at one end to one prong, and working at the other end, in the other prong, constructed and operating substantially as and for the purpose herein described.

68,858.—FARM FENCE.—Edwin Stiles, Cleveland, Ohio.

I claim the special construction and arrangement of a fence as herein specified.

69,859.—FAUCET.—Septimus C. Stokes, Manchester, N. H.

I claim the above specified combination, as well as the arrangemeut of the gib, D, and the screws, E, with the plug and body of the faucet.

I also claim its head, constructed as described, and applied to the body and plug of the faucet in manner as explained.

69,860.—FLOODGATE.—John B. Stoner, Lacon, Ill. Antedated October 1, 1867.

I claim a floodgate with escapes, reaching below, and with solid front above the escapes, and swung upon the cross beam by means of staples hinges placed in the edge or slide of the beam, a, facing the source of the stream, the gate resting at an inclination upon the bearings, at f f'.

69,861.—PORTABLE FLOOD FENCE.—John B. Stoner, Lacon, Ill. Antedated September 27, 1867.

I claim the post, a, box, b, rail, c, blocks, d d', and pins, e e', arranged, combined, constructed, and operating substantially as described.

69,862.—CORN PLANTER.—L. Study, Plum Hollow, Iowa.

I claim, 1st, The application directly to the axle, B', of seed droppers, C, which are provided with valves, i, in combination with cams, h, upon the seed tubes, g, and openers, f, upon the main frame, substantially as and for the purposes described.

2d, The chambered and radially grooved dropping devices, C C, provided with valves, c c, and adapted for the purpose substantially as described.

3d, The combination of a seed slide, d, which is moved by axle, B1, through the medium of spring, B3, the seed hoppers, E, the seed tubes, g, and the rotating droppers, C, constructed to operate substantially as described.

4th, The double acting clutches, b, applied on the axle, B', in such manner as to lock this axle to its frame, when the driving wheels, B, one or both are free to turn around said axle, substantially in the manner and for the purposes described.

69,863.—DEVICE FOR CAPPING SCREWS.—Orvin W. Swift, New Haven, Conn.

I claim the tubular die, D, with the rod, E, fitted within it, and provided with the blade, d, in combination with the bolster, A, for receiving the screw, B, and the set screw, C, or its equivalent, for holding screw, B, in position, while being capped, all constructed and arranged to operate substantially in the manner as and for the purpose specified.

69,864.—WASH BOARD.—James Thompson, Vevay, Ind.

I claim a washboard, A B, whose individual corrogations, b, and the whole or greater portion of the entire series, B, collectively, are curved concavities as and for the purpose specified.

69,865.—HORSE POWER.—Zacharias Tobias, Covington, Ohio.

I claim, 1st, The combination of the frame or frames, N S, line shaft, B, and center shaft, L, with each other, substantially as herein shown and described, and for the purpose set forth.

2d, The combination of the ropes or chains, W, and shaft or windlass, Y, with the frame, N, and its attachments, and with the frame, D, substantially as herein shown and described, and for the purpose set forth.

3d, Permanently attaching the power to the bolsters or axles of a wagon, substantially as herein shown and described, and for the purpose set forth.

4th, The combination of the timbers, T, and braces A', with the wheels, A, and frame, D, of the machine, substantially as herein shown and described, and for the purpose set forth.

69,866.—CLIP CIRCLE.—Isaac N. Topliff, Adrian, Mich. Antedated September 28, 1867.

I claim the construction of a clip circle, for carriages, etc., in the form and manner described, with the spur, B, for the purpose substantially as set forth.

69,867.—PLOW.—James Vaudegrift, Princeton, Ill.

I claim the combination with the beam, d, of the flange, g', or its described equivalent, the braces, e, arm j, adjustable collar, k, and screw, m, constructed and arranged in the manner herein shown and described, and employed, to adapt the plow for either light or heavy draft, in the manner set forth.

69,868.—ADJUSTABLE ROLLER FRAME FOR ELEVATOR PLATFORMS.—R. M. Van Sickler, New York city.

I claim the sides, a a, bearing the roller, C, when such sides are connected together by means of the cross bars, a2, having the downward projections, B, for receiving the frame upon the platform of the elevator, to prevent slipping, and longitudinal movement, as herein shown and described.

69,869.—PIPE FOR THE TRANSMISSION OF FLUIDS.—Ethan P. Vaux, Washington, D. C.

I claim, 1st, A pipe constructed and arranged for the transmission of fluids, having a hermetically sealed air chamber surrounding it, substantially as described.

2d, In combination therewith, the intermediate braces, whether consisting of disks or other radial supports, or supports of horizontal pipes, substantially as described.

3d, A two-fold pipe, the interior being a conduit for fluids, and the outer forming a hermetically sealed air chamber, when united at its curves or angles, substantially as described.

69,870.—COTTON BALE TIE.—Charles W. Wailey, New Orleans, La.

I claim, 1st, Constructing a cotton bale tie, with a projecting lip, C, and roller, G, substantially as described.

2d, Constructing a cotton bale tie with a projecting lip, C, and curved ridge, D, substantially as described.

3d, Constructing a cotton bale tie with a projecting lip, C, roller, G, and curved ridge, D, when the same are arranged substantially as described, and for the purpose set forth.

4th, Securing a cotton bale tie, having a curved projecting lip to the hoop, by means of the roller, G, loop, H, and rivet, I, when the same are so constructed as to form a hinge joint, substantially as described.

69,871.—ELEVATOR.—Joshua Walker, Kansas city, Mo.

I claim, 1st, In combination with the car tracks, laid at different hights, a movable section, C, arranged and applied in such a manner as to admit of being raised and lowered from one track to the other, and carry the car from one track to the other, substantially as set forth.

2d, The hinged rails or ways, I I, arranged with the arms, J J, and windlass, M, to operate in connection with the adjustable section, C, substantially as and for the purpose specified.

3d, The arrangement as shown of the arms, D D', and E, with the windlass, G, for the purpose of raising and lowering the section, C, for the purpose set forth.

69,872.—CONSTRUCTION OF FAGOT FOR BEAM.—George Walters and Thomas Shaffer, Phœnixville, Pa.

We claim a pile or fagot for wrought iron beams, girders, etc., composed of one or more bars for the web, and any desired number of bars for the flange or flanges, when the said bars are arranged and permanently secured together by bolts or rivets, as and for the purpose herein set forth.

69,873.—TOY ENGINE.—James L. Warren, New York city.

I claim the combination of the boiler, A, cord, b, and swivel joint, c, with the lamp, B, substantially as and for the purpose herein shown and described.

69,874.—PLOW.—Franklin Watson, Harrison, Ill.

I claim, 1st, The mold board, F, of snape described, and share, M, when combined as set forth.

2d, The springs, h and i, when combined and operated as described.

3d, The plow foot, D, mold board, F, share, M, support, G, standard, E, and springs, h and i, when combined and arranged substantially as described.

69,875.—EXTENSION LADDER.—T. Watson and C. Perry, Brooklyn, N. Y.

I claim, 1st, The manner of connecting the two trucks together, and the arrangement of the slides thereon, substantially as and for the purpose described.

2d, The arrangement of bar, j, for the slides to rest upon, substantially as and for the purposes described.

3d, The arrangement of the windlass for elevating the slides, between the base of the said slides and the axle of the rear truck, substantially as and for the purpose described.

4th, The employment in an extension ladder of guys, in combination with a windlass, substantially as and for the purpose described.

5th, The hub of the rear trunk constructed in the manner and for the purpose substantially as described.

6th, The arrangement upon the top of the ladder of a skeleton adjustable platform, constructed substantially as described.

69,876.—CORN DROPPER.—Lewis Weaver, Canton, Ohio.

I claim, 1st, The piece, f, having flanges, e e, thereon, attached to the box, E, in the manner and for the purpose specified.

2d, The spring, d, having the lip, p, thereon, and attached to the hopper, B, in the manner and for the purpose specified.

3d, The valve, K, having the hole, X, therein, and the lower parts, a and b, arranged in the manner and for the purpose specified.

69,877.—INDICATOR FOR PUNCHING MACHINE.—Wm. Welch (assignor to himself and Mathew Diamond), Bridgeport, Conn.

I claim, 1st, Providing an indicator which registers the strokes of devices making regular reciprocating movements, and of reciprocating gates, that are operated by eccentrically moving boxes, B, or their equivalents, substantially as set forth.

2d, The slotted sliding rod, F, when provided with pins, b b, and with a spring, h, and when combined with the pawl, i, ratchet wheel, H, and hand, e, and with the box, B, substantially as and for the purpose set forth.

3d, The manner herein shown and described of throwing the indicating apparatus out of gear, by means of the eccentric pin, j, fitting through an eye on the rod, i, substantially as herein shown and described.

4th, The arrangement of the pivoted plate, L, having an eccentric slot and fitting around the pin, n, and connected with the pawl, m, for the purpose of indicating the revolution of the lower disk on the hand of the disk above, as set forth.

69,878.—ANIMAL TRAP.—John Westcott, Patchogue, N. Y.

I claim the mole trap constructed as described, consisting of the iron forks, A A, formed at right angles upon the cross bars of the handles, the latter being pivoted together at a, and clamping between them the spring, B, said forks held open by means of the notched dog, C, between the cross bars, as herein set forth for the purpose specified.

69,879.—GRATE FOR COOKING STOVES.—Wm. H. Whitehead, Chicago, Ill.

I claim, 1st, The changeable revolving grate, E, in combination with the end plates, G and H, and front grate, P Q, for the purpose of changing the fire box from an open to a close grate, substantially as specified.

2d, The projection or lock, c, attached to the end plate, G, substantially as and for the purposes set forth.

3d, The back plate, B B' and C, when constructed substantially as described, and so located that the upper portion, C, will incline toward the front, the middle portion, B, incline backward, and the lower, B', remain vertical, so as to admit of a change in position of the grate, E, substantially as specified.

4th, The combination and arrangement of the front grate, P Q, back plate, B B' C, and the end plates, G and H, with an adjustable revolving bottom grate, E, constructed and operating substantially as specified.

69,880.—ELECTRO-MAGNETIC ENGINE.—Wm. Wickersham, Boston, Mass.

I claim, 1st, So forming metallic conductors in electro-magnetic engines that in their extension from one end to the other of said engine, they shall pass nearly round one or more electro-magnets, and so arranging them that when an electric current passes through said conducting bars it shall produce magnetic polarity in the said electro-magnets, substantially as described.

2d, In combination with said metallic conductors, the arrangement of the receptacle, b, substantially as and for the purpose described.

3d, So forming the electro-magnet in an electro-magnetic engine that it may become a part of the rim of a fly wheel, and so arranging it on the outer edge of a disk, in connection with the shaft, that when said rim revolves the shaft will revolve also as described.

4th, The cut-off arranged and constructed as described, in combination with the said metallic conductors, playing over the interrupted parts of said cut-off, as described.

5th, Adjusting in electro magnetic engines while they are in motion, the relation of the circuits to the magnets substantially as described, and for this purpose I claim the spiral slotted tube, k, arranged and operated substantially as described.

6th, In combination with said metallic conductors and magnetic fly wheel, the arrangement of two or any desirable number of said fly wheels on the same shaft, all operating together in the manner described.

7th, Arranging the conducting bars in groups around the shaft, and securing each group in its proper position, independently of the others, as described.

8th, Having the spaces between the groups of conducting bars filled with blocks of the same form of said spaces and having said blocks secured in their places by a metallic ring, K, as described.

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9th, Making said metallic conductors in a thin ribbon-like form, having one edge near the said electro magnet and the other edge from said magnet, all substantially as described and for the purpose set forth.

69,881.—HAY RAKER AND LOADER.—Hosea Willard, Vergennes, Vt.

I claim, 1st, The supplementary yielding pulleys, e e, attached to the axle, A, and at such points that the rake teeth of the endless elevator may yield or conform to the inequalities of the surface ever which they may pass, or to obstructions which may be in their path, substantially as and for the purpose specified.

2d, The oval wirers or clearers, h, placed on the shaft, G, of the endless elevator, substantially as and for the purpose set forth.

3d, The springs, K, for connecting the oblique rake wings to the frame, C, arranged as described for the purpose specified.

4th, The endless belts, P P, applied to the rake wings, substantially in the manner as and for the purpose set forth.

69,882.—OIL CUP.—Charles Williams, Vineland, N. J., assignor by mesne assignments to himself.

I claim the elastic tube, C, in combination with the nozzle, B, and of such length that the perforated ball, D, upon its lower end, shall reach either the top, side, or bottom of the can, A, as herein described, for the purpose specified.

69,883.—JAW FOR LATHE DOGS AND BENCH VISES.—Nathaniel Wilton, Groton, N. H.

I claim the combination in a lathe dog of the semi-cylindrical self-adjusting pieces or jaws, D, with the jaws, A and B, and screws, C, or their equivalents, substantially as herein shown and described and for the purpose set forth.

69,884.—BROOM HEAD.—J. Wisner, Aurora, and T. Rose, Cortlandville, N. Y.

We claim the combination of the screw bolt, g, with thumb screw upon each end, and the side or conical pins, d d, with the metal cap or case for holding the brush or corn as above described, and for the purpose set forth.

69,885.—CARRIAGE AND BUGGIE TOP BOW IRONS.—G. & A. Woeber, Davenport, Iowa.

1st, I claim providing sockets for receiving and fastening the ends of the bows of buggie and carriage tops, substantially in the manner and for the purposes as herein described.

2d, The construction and arrangement of flanges on the sockets, substantially in the manner and for the purpose as herein described.

3d, The hinges as constructed with plate, A, having pivots, a a a a, with holes in the pivots for screws, and plate, B, attached by screws, substantially in the manner and for the purposes as herein described.

4th, The sockets with flanges and the hinges with pivots, as constructed and arranged in combination with the bows and bow irons, substantially in the manner and for the purposes as herein described.

69,886.—WAGON BRAKE.—L. E. Woodard, Owasso, Mich.

1st, I claim the brake bar, B, connected by pins, b, working in the slots, c, in the ends of the cross bar, a, all constructed and arranged as described, for the purpose specified.

2d, The slotted metallic slide piece, D, upon the wagon reach, connected at one end to the bar, B, and in which the friction roller, k, is pivoted, constructed as described and operated by means of the eccentric piece, E, as herein set forth, for the purpose specified.

69,887.—COTTON PRESS AND FEEDER.—Henry Zellner, Columbia, Tenn.

1st, I claim the triangular chamber, B, situated between the shute, A, and the press, arranged as and for the purpose above described.

2d, I claim the arrangement of the foraminated cover, B', in connection with the chamber, B, and shute, A, in a hay or cotton press, substantially as and for the purpose described.

3d, I claim the combination of the shaft, I, cords or chains, H H', and toggle joint lever, F, with the pulleys, I I, working at the end of the fixed beam, K, substantially as and for the purpose specified.

4th, I claim the use of the pawls, o o o, substantially as and for the purpose described.

5th. I claim the arrangement of the shute, A, chamber, B, rollers, C C', lever, E, block, G, tube, D, and pawls, o o o, substantially as and for the purpose set forth.

69,888.—BURGLAR ALARM.—G. S. Acker, Kalamazoo, Mich.

1st, I claim connecting the spring alarm with the tripping wire, W, by the arrangement and combination of the pallet lever, H, with the toothed quadrant, I J, pawl, P, and tension spring, S, substantially as and for the purpose specified.

2d, I claim in combination with the spring alarm and tripping arrangement aforesaid, the geared levers, L L, when the same are connected to the window panes and operated by the window sashes of a building, substantially in the manner and for the uses set forth.

69,889.—ROOFING COMPOSITION.—C. B. Allen, St. Louis, Mo.

I claim the within described composition, composed of the articles herein set forth and used for the purposes specified.

69,890.—BOILER.—Henry Adler, Yellow Springs, Ohio.

1st, I claim the arrrangement, substantially as described, of the hot water jacket, A B K, steam chamber, E e, digester, G H I M, and stopper, L, as and for the purpose specified.

2d, In combination with the elements of the preceding clause, I claim the rotatable loops, C c C' c', serving the double purpose of handles and catches.

69,891.—MANUFACTURE OF MATCHES.—Emery Andrews, Portland, Me.

I claim uniting match splints in the form of a card, substantially in the manner and for the purpose specified.

69,892.—CAR BRAKE.—John L. Barnes, Etna Green, Ind.

I claim the swinging frame, G, with its shafts, E and R, wheels, J J, gears, H and I, used in combination with wheels, M M, upon the driving axle, and cords, C, rods, D D, and lever, R, for operating the carriage brakes by means of the lever, F, roller, d, and cord, a, when arranged in the manner and used substantially as and for the purposes specified.

69,893.—BRIDLE.—W. R. Beans, Brownsburg, Pa.

I claim the headstalls constructed with extensions rearwardly from the forehead strap having loops, b', at their rear ends for the retention of the safety reins in the desired position on the horse's neck, substantially as shown and described.

69,894.—APPARATUS FOR PROVING GAS PIPES.—A. C. Beardslee, Brooklyn, N. Y.

I claim, 1st, The combination of the bell, A, base piece, B, with its passages F H, diaphragm, C, spring borne graduated rod, D, and check valve, J, all for operation together substantially as and for the purpose herein set forth.

2d, The arrangement in connection with a diaphragm indicator substantially of the character specified, of an ether box, essentially as and for the purpose or purposes herein set forth.

69,895.—APPARATUS FOR DAMPING AND GUMMING LABELS.—Joseph Benn, Goat near Cockermouth, England, and George O. Luckman, Manchester, England.

We claim the apparatus described consisting of a reservoir connected to a damping chamber provided with a perforated plate or any combination of similar parts answering the same purposes and for effecting the same objects.

69,896.—COMBINED HOSE TONGS, CLAMP, WINCH AND PICK. Harry Bitter, Philadelphia, Pa.

I claim the combination of the facing ring, D, wrenches, d and e, and pick f, with a hose clamp, substantially as described and for the purposes specified.

69,897.—APPARATUS FOR RENDERING LARD AND TALLOW.—Amos Broadnax, New York City.

I claim, 1st, Rendering fat with a dry fire heat either in an open or a close tank by inclosing said tank in a heating chamber so made and arranged as to entirely surround the same, substantially as described.

2d, Combining a dry rendering apparatus in a dry heating chamber made of metal and placing said dry metal heating chamber in a brick chamber over the fire or furnace and so arranged as to leave a flue around the metal chamber, substantially as described.

3d, The use of the intervening plate, S, either with or without the fire brick or clay facing between the furnace and the tank by which the fire can be entirely excluded from the tank.

4th, Arranging an open rendering tank in a heating chamber made to entirely inclose it and arranged to allow the gas and vapor to escape in the chimney under a furnace, substantially as described.

5th, In combination with a rendering tank the use of a thermometer arranged in a tube in said tank filled with mercury, substantially as described.

6th, The use of a ventilator in combination with a rendering tank inclosed in a heating chamber for the purpose of reducing the temperature in said chamber, substantially as described.

7th, Making an intervening flue between the tank and the fire flue to aid in regulating the application of heat to the tank, substantially as described.

69,898.—BED CLOTHES HOLDER.—M. D. Brooks, Albany, N. Y.

I claim the combination of the rolls, E E, with the arms, A A and B B, and spiral springs, C C, arranged on a bedstead for holding the clothes of the bed, substantially as described.

69,899.—ROWLOCK FOR BOATS.—C. C. Burrows, Mystic River, Conn.

1st, I claim the slotted plate, A, Figs. 3 and 4, in combination with a reversible cap, C, hinged thereto and revolving thole permanently attached to the cap, substantially as set forth.

2e, In combination with the plate. A, having a longituninal slot, A', the reversible cap and thole and a button for securing the part rigidly when in use, arranged substantially as set forth.

69,900.—HAT VENTILATOR.—C. H. Coffin, San Francisco, Cal.

I claim as a new article of manufacture a hat ventilator provided with a slide or valve to close the openings and a flange of flexible metal teeth for fastening it to the hat.

69,901.—FOUNTAIN BRUSH.—Julius Davis, McLean, N. Y.

1st, I claim the revolving hollow cylinder, G, having its entire curved sides pierced with orifices, e, and covered with cloth, c, to allow the paint or white wash within it to escape gradually and spread itself evenly over the surface to be covered as the cylinder is rolled over it, substantially as and for the purpose described.

2d, The combination and arrangement of the revolving hollow cylinder, G, and brushes, B, when the cylinder and brushes are constructed and used substantially as and for the purpose hereinbefore particularly described.

3d, The combination and arrangement of the revolving hollow cylinder, G, brushes, B, and cup, A, when the cylinder, brushes and cup are constructed and used substantially as and for the purpose set forth and described.

4th, The combination and arrangement of the revolving hollow cylinder, G, brushes, B, cup, A, frame support, b C and C', socket, D, and handle, E, when the whole are constructed and used substantially as and for the purpose described.

69,902.—COOKING STOVE.—W. C. Davis, Cincinnati, Ohio.

I claim the base or pedestal, B, forming a completely inclosed closet or chamber having one or more doors, J, a floor, E, and interlocking flanges, D, and being adapted to take the place of the customary leg or feet of an ordinary cast cooking stove, as set forth.

69,903.—GRINDING MILL.—John Donaldson, Rockford, Ill.

1st, I claim the arrangement of the slots, i i, in wheel, E, with the pins adjustable in said slots and the feed levers, a and b, and discharge lever, a', operating in connection with the feed and discharge valves and the hulling machinery, substantially as described and for the purpose set forth.

2d, The arrangement and construction of the feed valve, P, and groove, R, in hopper, S, substantially as described.

69,904.—MODE OF COATING WROUGHT IRON WITH CAST STEEL. Josiah W. Ells, Pittsburgh, Pa.

I claim as a new and merchantable article of manufacture slabs, sheets, plates, bars and rods of wrought iron having a uniform coating, face or surface of cast steel, applied as hereinbefore set forth on any one or more or on all sides of the same and of any required degree of thickness.

69,905.—KNIFE CLEANER.—John A. Ewins, South Boston, Mass.

I claim the combination and arrangement of the polishing or cleaning cylinder and its operative mechanism with the self-adjusting presser and the guard, the whole being applied to a frame so as to operate as described.

69,906.—TWEER.—Frederick Fisher, Gloucester, Mass.

I claim the water tight vessel or reservoir, I J, surrounding or partially inclosing the main air tube, H, and the tubes, K K, in combination with the pipes, F and G, and the reservoir, E, substantially as and for the purpose specified.

69,907.—TENTER BARS FOR STRETCHING CLOTH.—J. Force and G. W. Renwick, Elgin, Ill.

We claim the combination of bars, H and H", friction wheels, t and t', screw, N, rod, L, and levers, e e, substantially as and for the purpose described.

69,908.—HARVESTER.—John Fox, Baltimore, Md.

I claim the broken or interrupted surface of the cam groove on the inner face of the driving wheel for actuating the roller and lever, substantially as herein recited.

69,909.—BRICK MOLD.—Francis M. Franklin, O. H. McIntire and William Whitely, Springfield, Ohio.

We claim the plunger with projecting centers on their inner faces to receive and support the packing and packing plates around them, as and for the purpose herein described.

Constructing the plunger of a brick press with packing and packing plates and tightening screws to permit the tightening of the upper and lower packing and packing plates at the same time while they may be separate from each other and the packing kept tight in the mold above and below, substantially as herein described and in combination with the above covering the face of the plunger with leather or some similar substance, as and for the purpose set forth.

The plunger of a brick press constructed with a suitable reservoir for oil or other substance to lubricate the inner surface of the mold, substantially as and for the purpose set forth and in combination with the above an opening in or across the plates inside of the mold to carry and supply the inside of the mold and edges of the packing constantly with oil so that the brick is kept from sticking to the mold and the packing from wearing, substantially as herein described.

Saturating with oil the leather or other material covering the face of the plunger by means of ducts passing through the plunger and communicating with the oil reservoir, substantially as set forth.

The cut-off which allows all of the surplus mortar to escape from the mold and stops that escape just in time to secure the mold being uniformly filled, substantially as herein described.

69,910.—BRIDLE BIT.—Joseph P. Gates, Lincoln, Ill.

I claim, 1st, The shape and construction of the bit bar, A, as herein described and for the purposes set forth.

2d, The double cheek disks, B B, constructed with the shuttle keys, H, studs, J, circular recess, N, and stop recesses, P Q R S, when arranged, combined and operated as herein described and for the purposes set forth.

69,911.—WRENCH.—Dennis Harrigan, Charlestown, Mass.

I claim my improved wrench as made not only with one of its jaws stationary with respect to and projecting from its rotary segmental plate and with the other jaw movable upon a bar parallel with the chord of such plate and projecting from the stationary jaw but as having a screw and a screw rack applied to the movable jaw and its supporting bar, the whole being arranged substantially in manner and so as to operate as specified.

Also the combination of such a wrench and means substantially as described (viz: the bolt holes, b b b, and the spring bolt, H), whereby its segmental plate may be fixed in position so as to cause it to move with the handle when moved in either direction that is forward or backward while the jaws may be hold of an object.

69,912.—RAILROAD CROSSING.—G. W. Harris and George Elliot, Aurora, Ind.

We claim, 1st, A railroad crossing formed by prolonging two rails of each track in opposite directions beyond the intersecting rails and having gains, B, and gaps, B', as and for the purpose set forth.

2d, In combination with such gained and intersecting rails we claim the knees, D, applied as herein made known.

69,913.—HORSE RAKE.—A. L. Haskell, Amity, Pa.

1st, I claim the combination of the main frame, S, the vibrating rake frame, A C, the rocking frame, m, and the lever, p, when all these parts are constructed and arranged for joint operation as and for the purpose described.

2d, The combination in a two-wheeled horse rake of rigid shafts projecting from the axle, a driver's seat mounted on the front cross bar near the left shaft, a vertically vibrating frame hinged to the rear of the axle and carrying a revolving rake, a rocking frame pivoted to the vibrating frame and carrying springs to control the rake and a lever pivoted on the vibrating frame linked to the rocking frame and carrying a hook taking into an eye on a standard in front of the axle by which to fasten the rake when lifted, up all constructed, arranged and operating as described

69,914.—GATE.—L. Hermance, Hudson, N. Y.

1st, I claim the box, E, with its disk, F, and wheel, G, constructed and used with the gate as and for the purpose set forth.

2d, The metallic loop, a, used with the gate for keeping its forward end down or supporting substantially as herein represented.

3d, I claim the metallic plate, H, with its arm when connected to the lower side of the gate post to prevent the gate from swinging out of position as specified.

69,915.—STRAW CUTTER.—Nelson Holmes, Laona, N. Y.

1st, The compound lever handle, I E, and the connected adjustable supports, K J and H, all constructed and arranged substantially in the manner and for the purposes specified.

Also the supporting bar, n, when placed in the cutting machine for the purpose set forth.

69,916.—BENDING MACHINE.—Gideon Huntington, Norwichville, Canada West.

1st, The flanged keys, A A, in combination with the grooved journal boxes and mortices in the upright when constructed and arranged to operate as described.

2d, In combination with the above and with the rolls, I claim the stationary and adjustable guides when arranged and operating substantially as described.

69,917.—ROOFING COMPOSITION.—A. P. Jackson, (assignor to himself and Otis Pratt, Warsaw, Ind.

I claim the composition above described, when compounded and used substantially as and for the purposes specified.

69,918.—DUMPING SLED.—J. L. Knoll, Hummelstown, Pa.

I claim the dumping apparatus, constructed and operating substantially as and for the purpose herein specified.

69,919.—SAFETY GUN LOCK.—W. F. Kussmaul, Baltimore, Md.

I claim the spring, E, having the bolt, H, in combination with the vertical slide, F, the mainspring, B, and the shoulder, G, substantially as and for the purpose specified.

69,920.—ATTACHMENT TO STIRRUPS.—Israel L. Landis, Lancaster, Pa.

I claim the detachable india rubber foot pad, a, when provided with side flaps, C, which are secured to the sides of the stirrup by means of buttons and button holes or their equivalents in the manner and for the purposes as herein set forth.

69,921.—HAT.—W. B. Lodge, Danbury, Conn.

I claim a hat made of wool-felt, having incorporated with it, after the hat is formed, or during the process of felting, fur-dust, substantially as herein set forth.

69,922.—MANUFACTURE OF TEA AND COFFEE POTS.—W. W. Lyman, (assignor to the Meriden Brittania Co.,) West Meriden, Conn.

I claim uniting a hard metal bottom with a soft metal or brittania body of a tea or coffee pot, substantially as described.

I claim a tea or coffee pot substantially as described.

69,923.—BUTTER WORKING AND PRINTING MACHINE.—A. S. and S. B. McDowell, Philadelphia, Pa.

1st, We claim the construction and arrangement of the mold, F, the adjustable bottom, E, the piston printer, D, the levers, B and C, the prop, L, the swinging hook, K, and the supporting stand, A, the same operating together substantially as and for the purpose described.

2d, In combination with a butter printing apparatus constructed and operating as described, we claim the fluted roller, G, turning loosely upon its axis, g', which is jointed to the post, a", as described and the sector shaped tray, H, grooved and perforated as described the same operating together as and for the purpose described.

69,924.—APPARATUS FOR PRESERVING FRUITS, MEATS, ETC.—John G. McMillan, Baltimore, Md.

1st, I claim the arrangement of water, steam and vent pipes with a spherical condenser when the said condenser is encased in a water tank for the purpose of alternately producing a vacuum, as herein specified.

2d, I claim the can receiver, K, cover, I, air tube, J, and connecting pipe, H, as constructed in combination with the condenser, D, operating in the manner as and for the purposes herein set forth.

3d, I claim the apparatus described by which the process of exhausting the atmosphere from cans, jars, or other vessels, containing fruits, vegetables, meats, or other substances without heating the cans or contents, substantially as herein set forth.

69,925.—SHEEP SHED AND RACK.—Gabriel McWilliams, Fostoria, Ohio.

I claim the herein described shed, and rack constructed in the manner and for the purpose substantially as set forth.

69,926.—COMPOSITION FOR PRODUCING ELASTIC FORMS FOR PRINTING.—Isaac L. Miles, Philidelphia, Pa.

I claim a composition for elastic printing forms consisting of the within described ingredients in combination with arsenic or its equivalent.

69,927.—CAR COUPLING.—Jacob Miller, Carrollton, Ohio.

1st, I claim the pivoted coupling piece, C C', and pin, c, adapted by vibration to disengage the coupling link, F, substantially as and for the purpose set forth.

2d, I claim the movable piece, G, in combination with the spring, H, substantially as and for the purpose specified.

3d, I claim the combination of the pivoted catch, C, pin, c, hook, B, spring plunger, D, and lever, F, all arranged and operating, substantially as and for the purpose specified.

4th, I claim the movable frame, G G', flange, G2, and spring plunger, H, arranged and employed, substantially as and for the purpose set forth.

69,928.—HOE AND POTATO DIGGER.—E. F. Morris and R. J. Green, Cicero, N. Y.

We claim the swinging beams, B, and shares or wings, F, connected with yielding links, f f, in connection with plows, D d, frame, A, and braces, g, all constructed arranged and operating as herein shown and for the purpose set forth.

69,929.—MECHANICAL MOVEMENT.—Julius Niebergall, New York City.

1st, I claim the combination with the shafts, a b, and the connecting rod, f, of the arm, k, and crank, j, substantially as set forth.

2d, The method substantially as herein shown of transmitting continuous rotary motion to a driven shaft through a connecting rod extending from the driving shaft by keeping the said rod at all times in a position parallel with a straight line extending from the driving to the driven shaft.

69,930.—APPARATUS FOR COOLING MALT LIQUORS.—Wm. Partington, Philadelphia, Pa.

1st, I claim the box, A, having a compartment bounded by sieves, a a1 and a2, and inlet and outlet pipes, all arranged substantially as and for the purpose herein set forth.

2d, The cooling box, B, containing the vessels, C and C1, and pipes or troughs, d d, the whole being constructed and arranged substantially as and for the purpose specified.

3d, The tubes, d d and f f1, in combination with the vessels, C and C1, of the box, B, or with the vessels, F F1, of the box, D.

4th, The combination of the boxes, A B and D, with the contents described, or their equivalents, and with the regulating faucets specified.

69,931.—SPARK ARRESTER.—Andrew Pearsall, Atlanta, Ga.

I claim the arrangement of the pipe, B, with its flange, E, and disk, G, as constructd in combination with pipe, A, having flange, D, formed as described, to project beneath flange, E, having outlet into chamber, C, as set forth and for the purposes described.

69,932.—WATER WHEEL.—P. D. Pike, Stowe, Vt.

I claim the cylindrical water wheel, A, with its center partition, E, having two apertures, G G, and two adjustable gates, B B, regulated by the lever, C, when constructed, combined, and operating as herein described and for the purpose set forth.

69,933.—WEIGHING SCALES.—J. P. Pope and J. T. Whipple, Chicago, Ill,

1st, We claim platform, C, suspended from platform, B, of the scales above, substantially as and for the purpose set forth.

2d, Rack, D, and balancing beam, m", substantially as and for the purpose described.

3d, The combination of rods, o o", jointed levers, s s", lever, W, and holding or stop rod, t, substantially as described.

69,934.—CHURN.—Edward Porter, Tallmadge, Ohio.

I claim the special arrangement of the radial arms, F, and shaft, D, in combination with the pail, A, in the manner as and for the purpose described.

69,935.—REIN HOLDER.—A. W. Potter and J. A. Barling, Monroe, Wis.

We claim the spring, A, when bent in the form, as shown, in combination with the board, B, substantially in the manner and for the purpose specified.

69,936.—MACHINE FOR BENDING METALS.—Robert Potts, Chatham, N. Y.

I claim the adjustable frame, D, arranged as specified, in combination with the sweep, A, substantially as and for the purpose described.

69,937.—EXTENSION TABLE.—A. E. Preston, Battle Creek, Mich.

I claim the combination of the revolving top, E, pivot, D, and receptacle, F, with the adjustable sliding srames, B and B', the whole constructed and operating substantially as described, and for the purposes set forth.

69,938.—RAILWAY CAR SEAT.—S. H. Rhoades and W. Carroll, Clyde, Ohio.

1st, We claim the extension links, C, when constructed with a sleeve, D, slide, E, and disk, F, as arranged and pivoted to the back, B, and seat, A, in the manner and for the purpose substantially as set forth.

2d, The disk, F, provided with a circular ratchet in combination with the spring, G, and back, constructed and arranged in relation to each other for the purpose and in the manner substantially as set forth.

3d, The adjustable head rest or section, K, spring, R, stay bars, M, and rod, O, as arranged in combination with the back, B, in the manner as and for the purpose set forth.

69,939.—BAKING FRAME.—T. C. Riddell, Wilmington, Del.

I claim providing the ordinary baking pan with a wooden frame and stirrups for holding it in place for the purpose of evenly baking bread or cakes in the manner herein before described.

69,940.—SUBMARINE VESSEL.—E. C. B. Rick, Hermann, Mo.

I claim the arrangement of a series of crank shafts, a, carrying pins, c, and connected by a rod, d, in combination with the adjusting screw, a, and vessel, A, constructed and operating substantially as and for the purpose set forth.

69,941.—BREECH-LOADING FIRE ARMS.—Angelina Snider, Philadelphia, Pa. Administratrix of the estate of Jacob Snider Jr., deceased. (Assignor to John Vaughan Snider)

1st I claim the breech piece, C, having a projection, a', adapted to a recess, a, at the rear of the barrel, when the said breech piece is hinged to and arranged to slide on a pin, D, for the purpose of extracting the cartridge all substantially as set forth.

2d, The combination of the breech piece, C, sleeve, E, pin, D, and extractor e, attached to the sleeve.

3d, The sleeve and its notched enlargement, d, in respect to the edge, g, of the frame.

69,942.—MOP WRINGER.—R. W. Soper, (assignor to himself, and Frank Richards), Janesville, Wis.

1st, I claim the arrangement of the supporting levers, D and D', with the cam piece, E, the former being provided with the cam grooves, f, and the latter with the cam pins, h, in such a manner that the vertical movement of the cam-piece shall operate the wringing rolls, C and C', substantially as described.

2d, The construction of the cam-piece, E, and guide, F, with the rectangular guide pin, i, and vertical groove or mortise, e, substantially as and for the purpose described.

3d, The arrangement of the treadle, G, pivoted on the ends of the yoke, I, with the cam, E, operating levers, D D', and spring, M, when the whole are constructed and used substantially as described.

69,943.—PLOW.—Geo. Spiehlman, Strasburgh, Pa.

1st, I claim the construction of the flattened and enlarged head, b, with its curved slot, of the standart, B, in combination with the application and arrangement of the hinge pieces, M N, forming the joint, J, of the beam and handle when all made in the manner and for the purpose specified.

2d, I claim the slotted wedge, K, in combination with the flanged and sunken tale piece of the point, E, constructed in the manner and for the purpose set forth.

3d, I also claim the mode of constructing and applying the sole piece, G, by ears and bolts to the base of the land side arranged as shown for the purpose specified.

4th, I also claim the extra heel piece, I, in combination with the mold board, D, when made and arranged in the manner set forth.

5th, I claim the combination and arrangement of the hinged beam, A, with the handle, C, the sole piece, G, heel, I, wedge, K, flanged point, E, and mold board, D, when all are made and arranged in the manner shown for the purpose specified.

69,944.—DRAWING AND TWISTING HEAD FOR SPINNING.—Ferdinand Spineux, Liége, Belgium.

I claim the roller, D, and its guide, e, for directing the course of the thread thereon in combination with the hollow spindles, A 1, substantially as shown and described.

69,945.—RAILWAY SWITCH.—W. H. Staats, Cresent, N. Y.

1st, I claim the laterally sliding connecting bars, E E', actuated on lines perpendicular to the course of the main track, to retain the train on the main track or divert it, to the siding, substantially in the manner set forth.

2d, The combination of the rails, A A1 A2 A3, with the shifting bar, H, blocks, D and D', and connecting bars, E, E' substantially as and for the purpose set forth.

3d, The rails, A A1 A2 A3, permanently fixed in combination with connecting bars, E E', sliding between the rails to connect alternately with the main track or siding, substantially in the manner set forth.

69,946.—RUFFLER FOR SEWING MACHINE.—A. Stewart, Plano, Ill.

I claim the spring plate, A B, constructed as described combined with the presser and arranged to operate in connection with the feeding apparatus, as and for the purposes described.

69,947.—LAYING TELEGRAPH WIRES ON RAILROADS.—D. W. Strong, Dutch Flat, Cal.

I claim the slotted brackets or holder, for retaining and protecting the wire, substantially as described.

69,948.—RULE AND LETTER SCALES.—T. G. Taylor, Lawrenceville, N. Y.

1st, I claim the rule, A, adapted as a letter scale, when constructed and operating substantially as described.

2d, The slide, C, spring, E, and plate, B, in combination with the rule, A, substantially as described for the purpose specified.

69,949.—CLAMP FOR TRAVELING TRUNK.—John W. Thorne, Brooklyn, N. Y.

I claim a trunk clamp, in which the metal at the angle is strengthened by the interior filling piece, i, rendering the same thicker, as and for the purposes set forth.

And in combination therewith, I claim the knuckle or angle brace, h, applied to the metal clamp for trunks, as and for the purposes set forth.

69,950.—MACHINE FOR IRONING HATS.—John T. Waring, Yonkers, N. Y.

1st I claim the lever, E, working in a universal joint, and made adjustable longitudinally and vertically, by means substantially as herein described, in combination with the smoothing iron, D, substantially as and for the purpose specified.

2d, The combination of the weight, h, and cord, e, with the chimney, d, pivoted to the smoothing iron, substantially as and for the purpose specified.

3d, The screw, m, in combination with the lever, E, and the smoothing iron pivoted thereto, substantially as and for the purpose specified.

69,951.—TOP PLATE OF COOKING STOVE.—John B. Crowley (assignor to Chamberlain & Co.), Cincinnati Ohio.

1st, I claim an extended top plate of a cooking stove, formed with the pit, D, cast in one piece therewith, as and for the object explained,

2d, The arrangement of extended top, A, pit, D, and deflecting plate, E, as and for the purpose set forth.

69,952.—WINDOW SASH ELEVATOR.—John Le Ferre, Charleston, Mass.

I claim the arrangement of the angular plates, C, and screws, f, provided with loops, g, in combination with the pulley, F, and block, G, connected to the window frame, and operated by the cord, D, in the manner and for the purposes specified.

69,953.—CALIPER GAGE.—John Richards, Cincinnati, Ohio.

I claim a fixed caliper gage, when constructed as herein specified, the outline being arcs of true circles, substantially as described.

69,954.—STANDARD GAGE.—John Richards, Cincinnati, O.

1st. I claim a standard gage constructed in the form of pyramidal cone, in the manner and for the purposes specified.

2d, I also claim the pedestal, b, or equivalent means of supporting the gag e

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in an inclined position, substantially in the manner and for the objects specified.

69,955.—APPARATUS FOR COOLING, FREEZING, AND HEATING.—Daniel E. Somes, Washington, D. C.

1st, I claim the combination of the vacuum and compressing chambers or their equivalents with the pumps or their equivalents.

2d, Atomizing tubes in combination with a vacuum or partial vacuum.

3d, Minute holes through the walls of the vacuum chamber for the admission of liquid, air, gas, or vapor.

4th, Tube with an atomizing lip or projection, in combination with a vacuum or partial vacuum.

5th, Closed air spaces, or non-conducting material, or refrigerating substance, or compounds, surrounding a vacuum or partial vacuum.

6th, A vacuum chamber constructed substantially as and for the purpose set forth.

7th, A compressing chamber with atomizing tubes or holes, substantially as and for the purpose set forth.

8th, Compressing and vacuum chambers with a safety valve between, as and for the purpose set forth and for other purposes.

9th, Pipes and cock, G, as and for the purpose described.

10th, Non-conducting spaces or substances between the compressing and vacuum chambers, substantially as and for the purpose set forth.

11th, The cases, D, in combination with a compressing chamber or with a vacuum or partial vacuum chamber.

11th, Tubes or channels extending through the compressing or vacuum chamber, substantially as and for the purpose set forth.

13th, Apartments or vessels constructed substantially as herein described, to prevent conduction of heat or cold, in connection with apparatus for rarefying or expanding air, gas, or other volatile substance.

14th, Chemical substances herein named, or others which may volatilize, singly or in combination, when used in a vacuum or partial vacuum in the form of mist or spray.

15th, Materials for lining the compressing and vacuum chambers, for the purposes set forth.

16th, A chamber containing liquid, air, gas, food, or any substance to be cooled, with channels tubes or spaces in, through, or around the same for passing, forcing, or drawing spray formed by atomizing a liquid or liquids.

REISSUES.

2,776.—WORKING BUTTER.—J. P. Corbin, Whitney's Point, N. Y., assignee by mesne assignments of Joseph Seymour. Patented December 20, 1859.

1st, I claim a vibrating rod, F, handle, G, and butter worker, H, combined and arranged to operate as shown, or in an equivalent manner, for the purpose set forth.

2d, The combination of the tray, B, with the butter working apparatus, arranged for joint operation, substantially as shown and described.

3d, The manner of tipping the tray or bowl to drain off the fluids, also of securing it to the table or frame for the purpose set forth.

2,777.—VOLUTE SPRING.—Joseph Hobart, Waltham, Mass., assignee of Daniel G. Rollin. Patented February 23, 1858.

1st, A double volute spring, having the bearing ends symmetrical, and playing endwise in the same line.

2d, A double volute spring, composed of a single plate, operating substantially as described.

2,778.—CLEANSING ANIMAL CHARCOAL.—The Union Sugar Refinery, Charlestown, Mass., assignees of Gustavus A. Jasper. Patented March 27, 1866

I claim the new or improved process substantially as hereinbefore described, for treating charcoal, either after or before its use, in a filter, for the cleansing of a saccharine or other liquid, the same consisting in boiling the charcoal in an acid solution, and washing it, the whole being essentially as specified.

I also claim, as the invention of the said Jasper, for removal from the charcoal of the gummy and other matter, except the lime or alkiline matter, the treatment or process of treating the charcoal without the use of acid, the same consisting in boiling the charcoal in water, or so boiling it and washing it, the charcoal being subsequently dried as set forth.

2,779.—MACHINE FOR MAKING NEEDLES.—C. P. S. Wardwell, Lake Village, N. H., assignee by mesne assignments of Frederick Plant. Patented June 19, 1860.

1st, I claim the combination of the traveling nippers or gripe, and stationary wire holder, or equivalent feeding device, cutting off shears, or device, and eye or groove punch or die, substantially as and for the purposes specified.

2d, I also claim the combination of the traveling nippers, or gripe, and stationary wire holder or equivalent feeding device, an eye or groove punch or die, and a tube or tubes, c, or equivalent wire or needle blank holder, substantially as and for the purposes herein set forth.

3d, I also claim the combination of the traveling nippers or gripe, and stationary wire holder, or equivalent feeding device, cutting-off shears or device, and one or more tubes or equivalent wire or needle holder, substantially as and for the purposes specified.

4th, I also claim the combination of one or more tubes, or equivalent wire or needler holder, and the wire or needle carrier, substantially as herein described, or equivalent device, for moving the wire or needle blanks, to the action of the operative devices, substantially as and for the purposes herein set forth.

5th, I also claim the combination of the cutting-off shears, or device, eye or groove, punch or die, one or both, and wire or needle carrier, or equivalent mover, substantially as and for the purposes herein set forth.

6th, I also claim the combination of the wire or needle carrier, or equivalent mover, one or more, pointing or reducing cut ers, and a bed or block to keep or rest the needle blanks against, substantially as and for the purposes herein specified.

7th, I also claim one or more revolving tubes, e e, for holding the needle blanks, or wires, constructed and operating substantially as and for the purposes herein described.

8th, I also claim the combination of the cutting-off shears or device, eye or groove, punch or die, singly or together, and wire or needle carrier or equivalent mover, with the cutting or grinding wheel, n, for flattening or "slabbing" the needle wire, or blanks, substantially as and for the purposes set forth.

9th, I also claim the combination of the wire or needle carrier, or equivalent mover, the flattening wheel, and the adjustable bed or block, to keep the needle blanks or wires to the flattening wheel, substantially as and for the purposes set forth.

10th, I also claim the combination of the wire or needle carrier, or equivalent mover, polishing wheel, and spring rest, for the purposes specified.

11th, I also claim the combination of the wire or needle carrier, or equivalent mover, and the barb bending mechanism, substantially as herein specified.

12th, I also claim a combination of mechanical devices, as described, or equivalents thereof, by which needles are automatically made from the wire, either including or not the bending of the barbs and the polishing of the needles.

2,780.—ROTARY HARROW.—O. D. Barret, Washington, D. C.

I claim causing two harrows jointed together, to rotate in opposite directions, by attaching the draught either above or below the plane, passing through the joint, D, parallel to the line of draught, substantially as specified.

DESIGNS.

2,800.—STOVE DOOR.—T. A. Dorgan, Baltimore, Md.

2,801.—FLOOR CLOTH PATTERN.—A. E. Powers (assignor to himself and Deborah Powers, and Nathaniel B. Powers), Lansingburgh, N. Y.

2,802.—PILASTER AND CENTER PIECE OF HEATER.—Charles J. Shepard, Brooklyn, N. Y.

2,803.—STOVE.—James Spear, Philadelphia, Pa.

PENDING APPLICATIONS FOR REISSUES.

Application has been made to the Commissioner of Patents for the Reissue of the following Patents, with new claims as subjoined. Parties who desire to oppose the grant of any of these reissues should immediately address MUNN & Co., *37 Park Row, N. Y.*

46,699.—PICTUTE CARD FRAME.—Garrett P. Bergen, Brooklyn, N. Y., assignee of R. W. Potter, New York City. Dated March 7, 1865. Application for reissue received and filed Oct. 9. 1867.

1st, A card frame for a picture formed with an opening embossed around its edges, substantially as set forth.

2d, Cutting a hole and simultaneously embossing the border in a picture frame substantially as specified.

21,879.—SELF-HOISTING HOOK.—The Middletown Tool Company Middletown, Conn., assignees by mesne assignments of J. A. Henshaw. Dated Oct. 26, 1858. Reissue No. 2,167. Dated Feb. 6, 1866. Application for reissue received and filed Sept. 28, 1867.

The combination and arrangement of the hook proper, eye, spring bar spring and checks to protect the spring, substantially as before set forth.

66,035.—BOOT CRIMPER.—De Witt C. Mourey, Milford, Mass. Dated June 25, 1867. Application for reissue received and filed Sept. 13, 1867.

I claim so combining the auxilliary jaws with the spreader, D, and clasp, A, that when such spreader is lowered between such jaws their lower ends shall approach each other and recede from the jaws of the clasp, substantially as and for the purpose as described.

I also claim the application of the auxilliary jaws to the clasp by means substantially as described, viz.: by the arms provided with ears and by the slot having the supports arranged as set forth.

26,637.—STRAW CUTTER.—Franklin B. Hurst, Richmond, Ind. assignee by mesne assignments of himself. Dated Dec. 27, 1859. Application for reissue received and filed Oct. 5, 1867.

1st, The horizontally sliding adjustable bar against which a rotary knife cuts, said bar being held down on its bed piece or bearings by vertical bolts or screws, substantially as shown.

2d, Combining in one piece the bed piece, R, to the adjustable bar, T, and the side pieces, V V, substantially as shown and described.

3d, The combination in a feed cutter of a single cylindrical knife and an adjustable bar, against which the knife cuts, said bar being held down to its bed by vertical bolts, substantially as set forth.

4th, The plate, Y, for the purpose of covering the joint between the adjustable bar, T, against which the knife cuts, and the bed piece, R, in manner substantially as shown.

5th, A feed roller whose shaft moves up and down in combination with a single cylindrical knife.

6th, The link bearing, M, attached to the shaft, D, and carrying the feed roll, Q, in combination with the spring, W, in such manner that as the roller rises it shortens the operative length of the springs and thereby gives the greatest pressure to the roll when most needed, in manner substantially as shown.

7th, Combining a revolving cutter knife with a fly wheel in such manner that when the knife is in rapid motion and meets with an obstruction the knife may be suddenly arrested and the fly wheel continue to revolve and expend its momentum independently of the rotation of the knife and thereby preserving the knife and other parts of the machine from injury by the sudden stoppage of said knife.

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CHAP. II. The Boiler—Marine boilers, distinguished from land boilers, gear connected with boilers, the tubular boiler, the number of boilers in each steam vessel, the steam chest, the fire bridge, ash pits, gunboat boilers, feed or donkey engine, boiler hand pumps, the safety valve, etc., etc.
CHAP. III. The Engine—Definition of steam engine, discoveries of Watt, single-acting engine, double acting engine, high pressure or non-condensig engine, marine steam engine, side-lever marine engine, paddle wheels, feathering paddles, reefing the paddles, disconnecting the wheels, methods of disconnecting paddle wheels, immersion of paddle wheels, paddle wheel brakes, the screw propeller; definition—length of screw; definition—angle of screw, pitch of screw, slip of screw, area of screw, thread of screw, diameter of screw, disconnecting the screw, methods of raising the screw, governors in screw ships, etc., etc.
CHAP. IV. Direct-action engines, gorgon engines, Fairbairn's engines, Maudslay's double-cylinder engines, Boulton and Watt's direct engines, Messrs. Miller and Ravenhill's direct engines, oscillating engines, engines for working the screw propeller, direct acting screw engines, direct-acting geared engines, oscillating horizontal engines, trunk engines, double-acting air-pump, Maudslay and Field's return connecting-rod engine, Humphrey's engine.
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25,418 Gray flannel Shirts.	184,836 Great Coat Straps.
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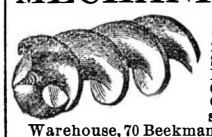

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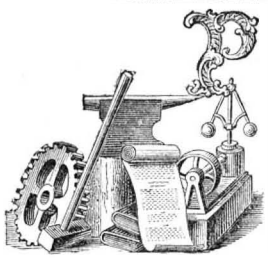

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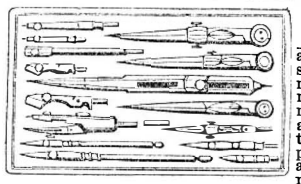

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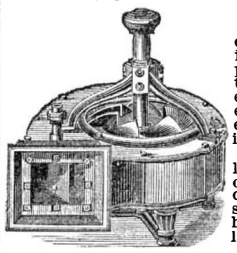

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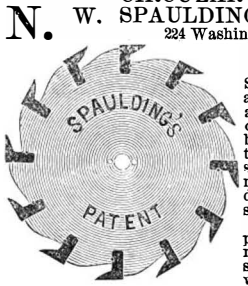

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